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University of Southampton

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**The Digital Transformation of
the UK's Grocery Market**

by

JE Munson

Thesis for the degree of Doctor of Philosophy

in Web Science

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Abstract

Online grocery is one of the fastest growing retail channels in the UK, but little is known about how the digital transformation of grocery shopping is affecting retailers or consumers. Research to date has focussed on defining the factors driving digital transformation strategies, but is sparse in its application to specific markets. The study of online grocery shopping practices has been limited to small-scale studies. Most have been qualitative in nature and rely on the respondents' reported intentions matching their actual online behaviour. This thesis uses WM Morrison Plc's (Morrisons) late entry to the market as a central case study to explore the digital transformation of traditional retailers and their consumers. An innovative sequential exploratory mixed-methods research design is employed. The qualitative phase consists of semi-structured interviews with key retail executives and focus groups with online consumers. These are triangulated to ascertain the drivers, strategic shifts and outcomes of digital transformation. The qualitative insights inform quantitative hypotheses tested using hundreds of thousands of real transactions drawn from Morrisons.com. The dataset represents probably the largest sample of online transaction data ever examined in academic online grocery shopping research. The dataset is also sensitively combined with existing national level analysis, increasing its generalisability to the UK's online grocery market. This thesis contributes to the strategic and management information literature by developing a powerful model of digital transformation, building on Matt et al's 'four dimensions' of digital transformation. The model describes digital transformation as a continuous and cyclical process which is bounded and driven by financial opportunities and the capacity to utilise new technologies, but also by a new dimension proposed in this thesis – namely the 'distribution of agency' (between retailer, consumer and technology). This new dimension furthers understanding of digital transformation by encapsulating online grocery shopping as a 'social machine' –

comprised of interacting human and technological agents. In low-profit environments such as the online grocery market, examination of the distribution of agency and how retailers and consumers react is particularly important to survival in the market. The application of the digital transformation model proposed in this thesis to the UK's online grocery industry shows that late-mover advantage is limited – the market is saturated and the high costs involved in delivering low margin perishable products make the market financially inhospitable. Entry is made more challenging for incumbent retailers by the emergence of non-traditional competitors who have more established technical skills and stronger relationships with online consumers. Despite low financial opportunities, the addition of the 'distribution of agency' dimension shows that there are opportunities to increase technological skill and embed these strategically. This thesis argues that those retailers who are able to manage their costs, utilise technology and nurture relationships with consumers to redress the 're-distribution of agency' from retailer to consumer have the best chance of survival. In terms of consumer practices, it is shown that contrary to extant research and the expectations of retailers, online consumers show little evidence of being price-sensitive or time-poor; and spend no less on perishable goods than offline consumers. Despite significant growth, online grocery shopping remains primarily the domain of customers from higher socio-demographic backgrounds. The model of digital transformation developed in this thesis arms practitioners with a powerful toolkit to predict and evaluate the success of digital transformation strategies. The introduction of the concept of 'distribution of agency' paves the way for practitioners in theory of practice and consumption theory to transform our understanding of consumer practices and complex socio-technical systems such as online grocery shopping.

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Research thesis: declaration of authorship

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Title of thesis: The Digital Transformation of the UK's Grocery Market

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research. I confirm that:

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7. Parts of this work have been published as:

Munson, J., Tiropanis, T. & Lowe, M., 2017. Online Grocery Shopping: Identifying Change in Consumption Practices. In: Internet Science. s.l.:Springer International Publishing, pp. 192-211.

Signature:

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Definitions

- **Digital transformation** – defined by this thesis as, “the reconfiguration of practices in response to, and in tandem with technological innovation”.
- **Traditional retailer** – used in this thesis to refer to companies that were formed prior to the invention/proliferation of e-commerce and which have historically had a presence in the form of physical stores. Also referred to as ‘incumbent’ and ‘bricks-and-mortar’ retailers in literature and the media.
- **Social machine** – the combination of human and technological agents acting together to achieve goals.
- **Web science** – the interdisciplinary study of the World Wide Web, its social interactions and its social implications. See [Appendix B](#).

1. Introduction

1.1 Motivation for this thesis

Since its invention in CERN in 1989 ([World Wide Web Foundation, 2012](#)), the web has permeated virtually all aspects of society, not least retail. As at May 2019, the Office for National Statistics (ONS) reported that online sales constituted 18.6% of all retail spending in the UK, up from 5.7% in May 2009 ([Murphy, 2019](#)).

Despite this surge in online shopping, one sector that has been slow to embrace the e-tail revolution is grocery shopping. Whilst the emergence of online grocery shopping has been slower to take hold than other sectors ([Wilner, 2015](#)) it currently occupies a 6% share of the UK's supermarket sales and is projected to comprise around 9% by 2020 ([Henry, 2015](#)). The slower growth in this sector has been attributed to two factors: supply-side issues (such as low margins and the logistical constraints of low-density deliveries ([Julka, 2016](#); [Murphy, 2003](#)); and conservative demand. Low demand is often attributed to consumers' desire to pick their own perishable goods such as fresh fruit, vegetables and meat ([Kestenbaum, 2017](#); [Thachenkary, 1997](#)).

Despite significantly slower market penetration, the UK is one of the few countries that has established a growing online grocery market, worth around £10.5bn p.a. in 2016 and projected to be worth £17.2bn by 2020 ([IGD, 2016](#); [Vasquez-Nicholson, 2015](#)). The UK has the second largest online grocery market in the world and the highest spend-per-person ([Table 1.1](#)). More than a quarter of all British grocery shoppers claimed to have shopped online for their groceries in January 2015, compared to a fifth in 2011 ([Henry, 2015](#)). For a detailed history of grocery shopping and the emergence of online, see [Appendix A](#).

Table 1.1: Global online grocery markets, 2015

Country	Population millions (2015)	Online grocery market, \$ bn (2015)	Online grocery market, £ bn estimate (2015)	Spend per person estimate (2015)	Spend Ratio, UK:Other
China	1,402	41	28	£19.89	8.03
UK	64	15	10	£159.76	1.00
Japan	127	12	8	£64.34	2.48
US	326	7	5	£14.58	10.96
France	65	9	6	£93.91	1.70
South Korea	51	7	5	£92.62	1.73
Germany	83	3	2	£24.71	6.46
Australia	24	2	1	£57.21	2.79
Belgium	11	1	0.7	£60.93	2.62
Netherlands	17	0.5	0.3	£20.00	7.99

Data source: Byfield-Green (2015)

In spite of a flurry of activity within the UK's online grocery market, studies tracking the digital transformation of traditional retailers remain sparse. **The shift to online grocery shopping presents challenges for traditional retailers who find themselves having to undergo a 'digital transformation' to maintain market share.**

Traditional (incumbent) supermarket retailers are striving to consolidate their online and offline presence in response to the changing habits of consumers. They are also competing with 'pureplay' (online-only) retailers such as Ocado; and new entrants such as Amazon – dominant in other e-commerce sectors and now looking to enter the UK grocery market. Grocery retailing is a particularly poignant case study due to the

overwhelming disincentives to market entry of low profit margins and high logistical burden.

The growing use of online grocery shopping services and technologies also presents a **potential shift in the way consumer behaviour and purchasing decisions are materialised**. As in other e-tail sectors, a number of market analysts have argued that there is a huge opportunity in online grocery shopping to gain insight into consumer behaviour via ‘big data’ accumulated by online consumption ([Marr, 2015](#); [Newman, 2016](#)). Despite this, there is little work accounting for new and contingent behaviours, not least because of historically poor access to retailers’ data.

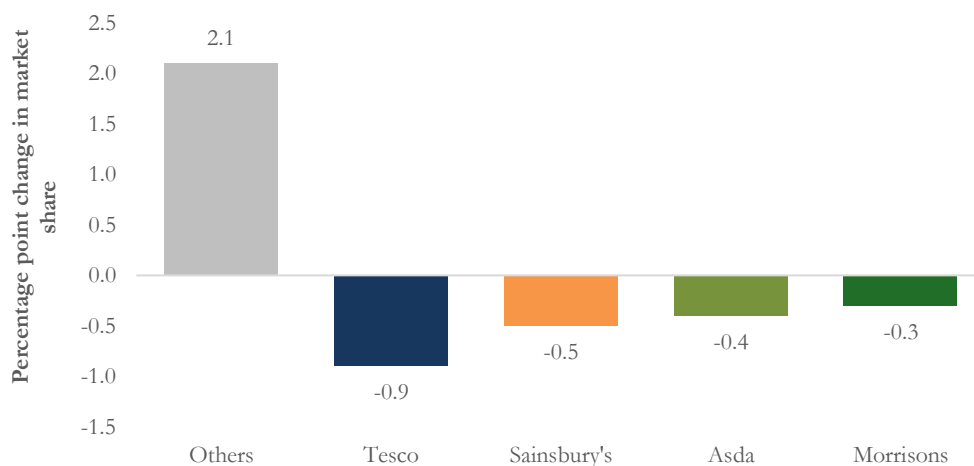
Understanding behavioural change entails game-changing potential for retailers, particularly in a low-margin industry such as the UK grocery market. The opportunities afforded by increased insight are numerous with respect to customer retention, complementary service provision, online and physical store planning, better lifetime value prediction, personalisation and brand reputation. The usefulness of understanding online grocery consumption is not limited to retailers however. Governments and town planners can benefit from understanding movement flows and practices in order to plan services more effectively. Technology designers can benefit from understanding technology use, especially in the interpretive flexibility of technologies. From an academic perspective, insights into consumer movements, habits and shopping practices contribute to the broader thesis of understanding socio-technical systems, social change and consumption behaviour.

In order to interrogate the digital transformation of the UK’s grocery market, this thesis draws upon a powerful and pertinent case study – namely WM Morrisons Plc’s (Morrisons’) late entry to the UK’s online grocery market. Morrisons is the UK’s fourth largest grocery retailer. Collectively, the ‘Big 4’ supermarkets constitute more than two thirds of the UK’s grocery market. The Big 4 dominance has declined slightly since

August 2017, with gains made by the discounters Aldi and Lidl and the convenience specialist Co-op ([Kantar, 2019](#)). Proportionally, Morrisons' has retained more of its market share than the other Big 4 supermarkets, maintaining around 10% of the UK's grocery market between 2017 and 2019 ([Figure 1.1](#)).

The target demographic of Morrisons has traditionally comprised lower income shoppers and families – groups that are not only offering a threat to traditional retail by their movement towards the online channel, but also the target of a resurgent offline channel – 'the discounters' such as Aldi and Lidl. The discounters possess an intriguing status as market entrants with lower overheads in the UK on the one hand, and an expanding (and counter-market trend) physical (store-based) presence on the other ([Armstrong, 2015](#)).

Figure 1.1: Percentage point change in market share between August 2017 and August 2019



Source: Kantar World Panel ([2019](#))

In 2014, Morrisons became the last of the Big 4 UK supermarkets to enter the online grocery market, nearly 20 years after the emergence of market leader Tesco's first sustained e-commerce presence. In a bid to 'catch up', Morrisons former CEO, Dalton Philips, decided to buy Ocado's platform 'off the shelf' in order to penetrate the e-grocery market more quickly and with fewer R&D costs. Philips agreed a 25-year contract with Ocado in 2013, which involved the purchase of Ocado's Dordon Customer Fulfilment Centre (CFC) and the licensing of Ocado Technology (both online and warehouse) ([Ruddick, 2016](#)). See [Appendix C](#) for more details of the deal brokered between Morrisons and Ocado. Morrisons is under pressure not only from the discounters, but also from those retailers who have made the transition to online more quickly. Online is a channel populated not only with its traditional competitors, but with a new wave of 'pureplay' market entrants such as Ocado, Amazon Fresh, Hello Fresh and Abel & Cole.

This thesis draws upon Morrisons as its primary case study, looking first at the organisational perspective of their late entry and ensuing digital transformation in joining the UK's online grocery market; and second at the consumer behaviour of Morrisons' customers since online inception. It should be noted however that the 'single case study' presented in this thesis provides a much wider dataset than normally found in this type of research. The unprecedented volume and quality of consumer data contributes understanding of the UK online grocery market as a whole. The dataset of hundreds of thousands of online transaction events represents one of the largest (if not the largest) samples of real-world online transaction data ever examined in academic online grocery shopping research.

Furthermore, the Morrisons dataset is sensitively combined with existing national level analysis to reduce the effect of biases in the Morrisons' customer and demographic, making findings generalisable to the UK's online grocery market.

1.2 Overall aim and research questions

The **overall aim** of this thesis is to determine:

How are traditional retailers and their consumers responding to the digital transformation of the UK's grocery shopping market?

To address this central research aim, four research questions (RQs) were developed. The first three questions relate to digital transformation in the UK's grocery market, the final question relates to the digital transformation of consumer behaviour.

RQ1: What are the drivers (and barriers) to entry in the UK's online grocery market?

RQ2: What strategic shifts occur when traditional supermarket retailers undergo digital transformation?

RQ3: What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

1.3 Methodological approach and scope of this thesis

In addressing the central aim and four research questions outlined in Section 1.2, this thesis adopts an interdisciplinary web science approach to the study of the UK's online

grocery market. The web science approach adopted in this thesis combines insights from strategic management, the theory of practice, statistical analysis and financial analysis to contribute to a socio-technical understanding of online grocery shopping. An innovative sequential exploratory mixed-methods research design is employed. The qualitative phase consists of semi-structured interviews with key retail executives and focus group observations with online consumers. These are triangulated to address the first three research questions (RQ1-RQ3) and to develop a model of digital transformation for incumbent firms. The qualitative insights also form the basis of eight quantitative hypotheses (RQ4) tested using hundreds of thousands of real consumer transactions taken from Morrisons.com.

1.4 Key findings

RQ1: What are the drivers (and barriers) to entry in the UK's online grocery market?

This thesis establishes that the primary driver of Morrisons' late entry to the UK's online grocery market was defensive. The move was consumer-demand driven with Morrisons looking to defend their existing consumer base, to recapture customers lost to rivals and to maintain supplier terms.

The application of the digital transformation model proposed in this thesis to the UK's online grocery industry as a whole highlights that it has low financial opportunity and that late-mover advantage is limited. Entry for traditional retailers is made more challenging by the entrance of non-traditional competitors such as Amazon, who have more established technical skills and stronger relationships with consumers.

RQ2: What strategic shifts occur when traditional supermarket retailers undergo digital transformation?

In terms of strategic shifts occurring during its digital transformation, it is shown that Morrisons entered the market with a low technical skillset and that this precipitated a loss of agency to the consumer and technology. Despite this, the innovative 'coopetitive' relationship with Ocado evidences Morrisons' willingness to redress the power-balance.

The online market offers low financial opportunities and high logistical overheads for incumbent retailers. Despite this shift in power towards the consumer with the convenience of home delivery, the addition of the 'distribution of agency' dimension to Matt et al's 'four dimensions of digital transformation' shows that there are opportunities to increase technological skill and embed this strategically. This allows incumbent retailers the opportunity to redress the retailer-consumer power balance; or to hedge the risk from new entrants, as in the case of Morrisons' agreement with Amazon.

RQ3: What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

Initial financial indicators suggest that Morrisons' firm performance since online inception has been strong. Despite this, operating profits and firm value remain lower than in 2013, prior to the loss-making years of 2014 and 2015. Morrisons' capacity to sustain improvements reside in their ability to manage the relationship with Ocado efficiently; and in expanding the consumer base or making online customers more

valuable, to mitigate the risk of market cannibalisation. This will be challenging given the high price-competition still dominating the UK's grocery market. More generally, this thesis argues that those retailers who are able to manage their costs, and those able to nurture relationships with consumers to redress the 're-distribution of agency' from retailer to consumer have the best chance of surviving the market.

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

In terms of consumer practices, it is shown that contrary to extant research and the expectations of retailers, online consumers show little evidence of being price-sensitive or time-poor; and spend no less on perishable goods than offline consumers. Among Morrisons' consumer base it is shown that despite substantial growth, online shoppers tend to belong to the wealthier ABC1 social groupings and that most shoppers are female. Specifically, this thesis establishes that there is sufficient evidence to accept the following alternative hypotheses:

Some evidence to reject $H_{04.1}$ and accept alternative hypothesis:

- $H_{A4.1}$ 'Time-on-site per transaction' in 2017 was statistically less than 'time on site per transaction' in 2018.

The confidence interval around the difference in medians between 2017 and 2018 suggest that the increase in time on site per transaction was only a few minutes.

Evidence to reject $H_{04.2}$ and accept alternative hypothesis:

- $H_{A4.2}$ 'Time-on-site per transaction' for one-day shoppers was statistically less than 'time on site per transaction' for multi-day shoppers.

The difference in medians between the one-day and multi-day shoppers amounted to over an hour, supporting the finding that shoppers who transact multiple times over a number of days spend more time on their shop than those who transact once.

Some evidence to reject $H_{04.4}$ and accept alternative hypothesis:

- $H_{A4.3}$ *'Time on site per transaction per day' for one-day shoppers was statistically more than 'time on site per transaction per day' for multi-day shoppers.*

Despite there being a statistically significant difference between the median times, the difference was small at around two minutes - the results suggest that multi-day shoppers spend almost as much time per day of their multi-day transaction as one-day shoppers do in total.

Evidence to reject $H_{04.4}$ and accept the alternative hypothesis:

- $H_{A4.4}$ *'Time on site per transaction' for one-day shoppers in 2018 was less than 'time on site per transaction' for one-day shoppers in 2017.*

There is moderate evidence that the time on-site per day for one-day transactions decreased between 2017 and 2018 with the median time on site decreasing by around seven minutes.

Evidence to reject $H_{04.5}$ and accept the alternative hypothesis:

- $H_{A4.5}$ *'Time on site per transaction per day' for multi-day shoppers in 2018 was statistically lower than 'time on site per transaction' for multi-day shoppers in 2017.*

The time per transaction per day for multi-day shoppers decreased by around ten minutes between 2017 and 2018.

Evidence to reject $H_{06.3}$ and accept the alternative hypothesis:

- $H_{A6.3}$ *The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2016.*

Evidence to reject $H_{07.1}$ and accept the alternative hypothesis:

- $H_{A7.1}$ *The average basket value is different on desktop, tablet and mobile devices (Desktop > Tablet > Mobile in general).*

1.4 Contributions

This thesis makes a significant contribution to the digital transformation literature, as well as more broadly to the fields of web science, management studies, strategy, consumer psychology, retail, social theory and to mixed-methods research design. The key contributions of this thesis are briefly discussed below. These contributions are outlined in detail in Sections 8.1-8.3 and summarised in [Table 8.3](#).

This thesis assesses the digital transformation of the UK's grocery market from the perspective of incumbent retailers and consumers by:

- analysing the digital transformation of traditional UK retailers (RQ1-RQ3); and
- exploring the perceived and realised changes in the make-up and purchasing practices of online consumers (RQ4).

Theoretically, this thesis contributes to the strategic and management information literature by introducing a powerful cyclical model of digital transformation, building on Matt et al's (2015) 'four dimensions' of digital transformation.

This thesis models digital transformation as a continuous and cyclical process which is bounded and driven by Matt et al's dimensions: financial aspects (constraints and opportunities) and use of technologies (by retailers and consumers), but also by a new dimension proposed in this thesis, namely the 'distribution of agency' (between retailer, consumer and technology). This new dimension furthers understanding of digital transformation by encapsulating online grocery shopping as a 'social machine' – comprised of human and technological agents acting together to achieve goals; and showing how agency is distributed between the retailer, technology and consumer. In low-profit environments such as the online grocery market, examination of the distribution of agency and how retailers and consumers react could be core to survival

in the market. The understanding of social machines also has implications beyond management studies in terms of understanding consumer practices and the interaction of human and non-human agents.

The model proposed in this thesis also supplements Matt et al's model with a high-low scale to measure the extent to which a retailer has the capacity to create new customer value and embed this within its core strategy. This model can be used by practitioners in management studies and beyond to predict and evaluate the speed and success of a company's (or industry's) digital transformation (see [Figure 8.2](#), [Table 8.2](#), [Table 8.3](#)).

This model enables comparison of individual firms within their market; and comparison of markets and sectors undergoing digital transformation. The model brings together the fields of web science and management and shows how thinking of online grocery shopping as a socio-technical system comprised of retailer, technology and consumer can enhance our understanding of digital transformation and consumer practices.

Methodologically, this thesis shows how a sequential exploratory approach can be used to generate hypotheses relating to the digital transformation of the UK's grocery market from qualitative data; and then how to test these hypotheses empirically using quantitative methods. This mixed-methods approach was driven by a web science approach which showed how thinking of consumer behaviour in terms of concurrent practices provides potential for understanding seemingly contradictory and 'irrational' behaviours not well modelled by the 'intention-behaviour' link. Emanating from this approach, this thesis provides evidence of online consumer behaviour not consistent with the assumptions of retailers and much previous literature. It shows that online

grocery shoppers were not averse to purchasing perishable goods online; and were becoming less price-sensitive and time-sensitive over time.

Empirically, this thesis uncovers the opportunities and challenges faced by incumbent retailers and their consumers are explored using the UK's fourth largest supermarket retailer, WM Morrisons Plc (Morrisons) as a primary case study. Morrisons forms a particularly poignant case study due to the landmark relationships it has formed with Ocado and Amazon Fresh in its bid to catch up following its entrance into the online grocery market some 20 years after pioneer Tesco's first foray. The digital transformation of a traditional retailer such as Morrisons, not known for technological innovation, provides perspective on the longevity and nimbleness of established companies to embrace technological change. The opportunity to reflect upon the digital transformation of a company in real-time without the benefit (or bias) of retrospect is rare. The quality of the dataset used in this thesis to examine the characteristics and behaviours of online grocery shoppers is unprecedented. The dataset consists of hundreds of thousands of real transaction events on Morrisons.com, representing up to 10% of all UK consumers. Paired with the adjustments suggested to align the dataset to the UK as a whole, this offers meaningful insights for online grocery shopping at the national level. Previous studies have generally relied upon small-scale studies, often qualitative in nature and often relying on the 'intention-behaviour link' assumption. This thesis establishes that despite significant growth, online grocery shopping remains primarily the domain of customers from higher socio-demographic backgrounds. The assumption (held by retailers and often reported in research to date) that consumers are time-poor and price-sensitive is shown not to be the case for the hundreds of thousands of transaction events examined. Furthermore, the propensity to shop for fresh produce in-store as opposed to online is not shown to be true among Morrisons shoppers or at the national level.

1.5 Organisation of this thesis

This chapter has highlighted the motivation for this thesis – namely a lack of empirical and theoretical work exploring the digital transformation of the UK's grocery market from the perspective of traditional grocery retailers and their consumers. Four research questions were identified, and the contributions of this thesis were outlined. In particular, the methodological contribution of adopting a web science approach was addressed. The organisation of the remainder of this thesis is outlined below.

- **2. Literature review and research gaps: digital transformation** reviews existing approaches to digital transformation and identifies gaps in the literature motivating the derivation of four research questions addressed in this thesis.
- **3. Literature review and research gaps: consumer behaviour** reviews existing approaches to consumer practices and identifies gaps in the literature motivating the derivation of four research questions addressed in this thesis.
- **4. Methodology** describes the theoretical rationale for the final research design adopted in this thesis. It also describes the practical operationalisation of the methods employed.
- **5. Qualitative findings and discussion** presents the results of qualitative interviews with Morrisons executives, a competitor and retail analyst; and the findings of observing focus groups with consumers. This chapter also includes a discussion of the qualitative findings and the formulation of hypotheses tested in the quantitative phase.
- **6. Quantitative results** presents the results of the quantitative investigation of Morrisons.com transaction data and comparison with national survey data.

- **7. Discussion of quantitative results and triangulation with qualitative findings** triangulates the qualitative and quantitative results to address core aim and four research questions of this thesis.
- **8. Conclusion** outlines the key findings of this thesis and explains its empirical, methodological and theoretical contributions mentioned above in more detail. It also identifies the limitations of this thesis and outlines the further work needed in the field of the digital transformation of grocery shopping and online grocery consumption.

2. Literature review and research gaps: digital transformation

This literature review is split into two chapters. Chapter 2 considers literature pertaining to the digital transformation of retail; and Chapter 3 discusses the literature relating to consumer practices in the digital era.

Section 2.1 gives an overview of digital transformation in the extant literature. It focuses on the debates around the drivers (and barriers), strategic shifts and outcomes of digital transformation and shows the limitations of approaches adopted to date, particularly with respect to the online grocery market.

Section 2.2 identifies gaps in the literature addressed by this thesis and outlines the derivation of the first three research questions (see [Section 1.2](#)) addressed in this thesis.

2.1 Digital transformation

It is more than twenty years since the buzz of e-commerce first captured the imagination of retailers and yet, according to a comprehensive Forrester survey, only 56% of enterprises believe they are undergoing digital transformation; and a further 22% are still investigating the idea or have no intention to undergo digital transformation ([Schadler, 2018](#)). This reticence is surprising given that in the UK, internet sales as a proportion of total retail sales have grown year on year from 3.4% in 2007 to 16.3% in 2017, peaking at just under 20% in December of 2017 ([Murphy, 2019](#)). For those who have made the leap, the study of the challenges faced by

incumbent retailers entering online markets and transforming their digital strategies remains patchy.

This section discusses the digital transformation literature to date, and uncovers gaps in current understanding which inform the research questions addressed by this thesis.

2.1.1 Defining digital transformation

An inordinate amount of the academic work in digital transformation to date has grappled with defining the term. Morakanyane ([2017](#))’s review of digital transformation literature identified eleven distinct definitions of digital transformation. Definitions vary widely in their scope. For some, the term is a management construct describing the extent to which a (new) technology has been acknowledged and integrated into a business ([Liu, 2011](#); [Mithas, 2013](#)). For others the technologically provoked change encompasses all aspects of a business’ strategy, including its value proposition ([Piccinini and Gregory, 2015b](#); [Hess et al, 2016](#); [Fitzgerald et al, 2013](#); [Lucas et al, 2013](#); [Bharadwaj et al, 2013](#); [Chanas and Hess, 2016](#); [Westerman, 2011](#); [Schuchmann, 2015](#); [Schadler, 2018](#)). For Stolterman and Fors ([2004](#), p. 689), the digital transformation of a business model is more holistic, driven by “the changes associated with the application of digital technology in all aspects of human society.” In terms of the strategic and cultural changes occurring in an incumbent business a well-articulated definition is as follows:

Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to customers. It’s also a cultural change that requires organisations to continually challenge the status quo, experiment, and get comfortable with failure. ([The Enterprisers Project, no date](#))

Where this definition falls short is in encompassing the digital transformation of society and consumer behaviour so vital to shaping the strategic response. This thesis refers to **digital transformation** in this sense, broadly defining it as follows:

Digital transformation is the reconfiguration of practices in response to, and in tandem with technological innovation.

The debate among authors to define digital transformation may seem trivial, but underlying this debate is a broader aim of scoping out the features of digital transformation strategies; determining the drivers of digital transformation and deciding how such a complex process can be measured.

For a traditional retailer, the transformation required to enter the online market can be substantial. Literature from the business and management communities has focused on the drivers of and barriers to digitisation; the strategic changes required; and the outcomes pertaining to successful and unsuccessful digital transformation. The extant literature relating to these three components of digital transformation are considered in turn the following sections.

2.1.2 Barriers to and drivers of digital transformation

Barriers to digital transformation

For even the most willing, incumbent firms are faced with a raft of barriers that make entering online markets and embracing technological change difficult. A number of financially motivated barriers to entering online markets have been identified including

‘cannibalisation’ of the existing customer base; prior strategic commitments; initial outlay costs; ongoing maintenance costs; and a lack of incentives to join mature markets ([Fuentelsaz et al, 2014](#); [Agarwal et al, 2010](#)). Mascarenhas ([1992](#)) found that first entrants that survive maintain higher long-term market shares than later entrants. In some industries, regulatory requirements can be cumbersome. Westerman ([2011](#)) suggests that the consumer demand for interactivity would quickly drive up costs and complexity. The investment and maintenance costs seem to affect some industries more than others - as Kohli ([2011](#)) noted - many of the industries that have been latecomers to digital transformation (such as the mining industries) depend on specialised, complex industrial machinery involving large capital investments to digitise. Despite acknowledging the clear disincentives to digitisation for industries such as oil and natural gas, Kohli ([2011](#)) also described industries that had made the transition as more ‘digitally savvy’, perpetuating a normative view of inevitability in the digital transformation of all industries ([Kohli, 2011](#)). Less financially motivated disincentives cited include the up-skilling requirements to embrace the new technology and the disruption to operations caused by engaging in a digital transformation ([Agarwal et al, 2010](#)). Fountain ([2001](#)) approached the interplay of a firm’s human agents and technologies from a socio-technical standpoint, claiming that the “material components of technology represent a potential capability of little practical value to an individual or an organization unless or until knowledgeable agents use them.” ([Fountain, 2001](#), p. 9)

Piccinini et al ([2015a](#)) and Smith ([2008](#)) also highlighted the importance of human agents and interpretive flexibility in shaping the use of technologies: “With the mutual maturation of the personal computer and the Internet, the ‘bleeding edge’ has been taken over by individuals who are persistently finding new and different ways to use technology.” ([Smith, 2008](#), p. 410)

Whilst the disincentives to digitisation have been sufficient to stop some market sectors and individual firms from engaging fully in e-commerce (e.g. Co-op and the discounters in the UK's grocery market); others have been drawn in. Literature identifying the factors driving this transformation are discussed in the next section. A summary of the barriers to digital transformation and online market entry are found in [Table 2.1](#).

Table 2.1: Barriers to digital transformation and online market entry – relevant to RQ1

Barrier	Field(s)	Example(s)
Cannibalisation of customer-base: spending more money on online / multi- / omni-channel only to recapture the same customers on the new platform)	Strategic management	Fuentelsaz et al (2015)
Initial outlay and maintenance costs of new channel / technology	Strategic management, Management, Information systems (healthcare), Management information (oil industry)	Westerman (2011); Fuentelsaz et al (2015); Agarwal et al (2010); Kohli (2011)
Lower potential market share / longevity as a late entrant	Strategic management	Mascarenhas (1992)
Regulatory constraints	Management information (oil industry)	Kohli (2011)
Up-skilling requirements	Information systems (healthcare, automotive industry)	Agarwal et al (2010); Piccinini and Gregory (2015b)
Interpretive flexibility / unpredictable use of technologies	Public sector/governance, food journalist	Fountain (2001); Smith (2008)
Business leaders often dissatisfied with the use of IT in the organisation	Retail	Hansen and Kien (2015)
Have difficulty emulating successful IT strategies	Retail	Hansen and Kien (2015)

Drivers of digital transformation

Bharadwaj et al ([2013](#)) identified a number of endogenous drivers of digital transformation including increased familiarity with technologies; pressure from CIO/tech teams; time saving; money saving; consolidation of existing systems; and opportunities to communicate better with customers. As Westerman ([2011](#), p. 14) remarked, “[l]iberated from routine order collection, the sales team could focus on building stronger relationships.” Despite some evidence of internally motivated change, endogenous drivers tend to be rooted in exogenous pressures. As DiMaggio and Powell ([1983](#)) discuss in relation to ‘institutional isomorphism’, normative pressures among CIOs networking with competitors can bring market strategies into alignment. Similarly, Tamm ([2015](#)) cited pressure from competitors who had already undergone technological transformation as a key driver. They highlighted the importance of digitisation in supermarket operations in particular, where they suggested that low margins and high volumes required the ability to compete on price and have the correct stock levels in stores at all times ([Tamm, 2015](#), p. 183). For those in highly regulated industries and government settings, the pressure to digitise can be pushed upon them in the form of compliance requirements ([Fountain, 2001](#)). Mithas ([2013](#)) suggest that convergence to a market norm is largely a product of the environment - buoyant markets where there is less competition for profit and concentrated markets tend to see convergence (imitation) in IT strategies; whilst turbulent markets see strategic divergence (differentiation). Latecomer industries and firms embarking on digitisation face opportunities, as well as the challenges of cannibalisation and reduced market share. They can learn from best practices and the mistakes of firms and industries who have been through the change process ([Kohli, 2011](#)).

Aside from pressure from competitors and regulators, firms are driven by consumer demand and changes in consumer behaviour and preferences. Dutta and Biren ([2001](#))

concluded that the increased connectivity of the digital era has seen changes in the ways consumers and producers interact, “Due to the real-time online nature of the Internet, relationships between organisations and customers are becoming more interactive in the market space.” ([Dutta and Biren, 2001](#), p. 450). Piccinini and Gregory ([2015b](#)) and Setia ([2013](#)) also suggested that connecting with consumers facilitates co-creation and value for the firm, by allowing customers to share tips, point out glitches and lobby for changes. These customers have become their de facto product development teams ([Huang, 2012](#)). The plethora of data collected on individuals is facilitating ‘hyper-differentiation’ or personalised marketing and product delivery. Several authors have suggested personalisation is also consumer driven, with customers demanding products and services tailored to their preferences ([Setia, 2013](#); [Piccinini and Gregory, 2015b](#)). How consumers respond to personalisation strategies is less well studied.

It appears that increased information and the democratisation of technologies have also allowed consumers to increase their digital competence,

One no longer needs a travel agent to recommend a property or book a hotel.

One no longer needs a sales person to explain or recommend a camera and one no longer even needs a service representative to deal with problems with purchases... Customers gain an accurate and precise understanding of price and of the exact set of attributes that each good or service offers them. ([Lucas et al, 2013](#), p. 378)

Consumers are able to leverage social networks not only to communicate with retailers, but to keep each other informed. Specifically, the role of social interaction in shaping consumer behaviour has been highlighted:

The phenomenon of users recommending favourites to friends and followers plays an important role in shaping other users' behaviours and purchases. ([Lee, 2013](#), p. 687)

Many authors have argued web technologies are shaping consumer and retailer behaviour. Hansen and Kien ([2015](#)) highlight that mobile technology is enabling customers to shop 'anytime and anywhere' and that customer propensity to shop both online and offline as a key driver of firm's move towards omni-channel retailing. As with personalisation, evidence of these perceived effects on either consumer or retailer strategy remains poorly understood, particularly in the grocery sector.

This section has identified the most often cited drivers of digital transformation and shown that there are conflicts not only in the definition of digital transformation but also in which drivers are most important to a given industry or firm. The role of human and non-human agents in shaping technology use has been proposed, but there remains little evidence of how this has manifested itself in digital transformation processes to date. A number of 'domain specific' consumer and strategic behaviours have been suggested, such as an increased demand for personalisation and consumers shopping anytime and anywhere, although the realisation of these strategies is not well documented in the extant literature. A summary of the key literature pertaining to the drivers of digital transformation are summarised in [Table 2.2](#). The next section considers the literature concerning the strategic changes that occur during digital transformation.

Table 2.2: Drivers of digital transformation and online market entry – relevant to RQ1

Driver	Field(s)	Example(s)
Increased familiarity with modern technologies	Strategic management	Bharadwaj et al (2013)
Pressure from CIO / tech team	Strategic management	Bharadwaj et al (2013)
Money saving, economies of scale - modernisation of systems, reduced costs in some industries	Strategic management	Bharadwaj et al (2013)
Time saving	Strategic management	Bharadwaj et al (2013)
Consolidation of systems, communication and brand	Strategic management, Retail, Information systems	Bharadwaj et al (2013); Hansen and Kien (2015); Loebbecke (2015); Stielglitz (2012)
Better customer relationships/preserve relationships; presence and visibility	Strategic management, Public sector/governance,	Bharadwaj et al (2013); Westerman (2011); Fountain (2001); Luna-Reyes (2014)
Normative pressures/competition	Information systems, strategic management	DiMaggio and Powell (1983); Tamm, (2015); Chen et al (2014)
Regulatory requirements	Public sector/governance	Fountain (2001)
Market environment	Strategic management (manufacturing)	Mithas (2013); Buschmeyer et al (2016)
Opportunity to learn from others (benefit of late market entry)	Management information (oil industry)	Kohli (2011)
Consumer demand for interactivity with retailer	Information systems (automotive industry)	Piccinini and Gregory (2015b)
Personalised marketing and products	Information systems (automotive industry)	Piccinini and Gregory (2015b); Setia (2013)
Consumer digital literacy	Information systems (automotive industry)	Piccinini et al (2015a)

Improved price/performance of IT; Mobile technologies capacity for anytime, anyplace; Growth of cloud computing	Retail, strategic management	Hansen et al (2011); Bharadwaj et al (2013); Stielglitz (2012)
Complement in-store experience	Retail	Hansen and Kien (2015)
Competitive advantage (whilst it lasts)	Information systems	Loebbecke (2015)
Feedback from consumers / better respond to consumers	Public sector, governance, management information, information systems	Luna-Reyes (2014); Setia (2013)
Pressure / demand from consumers for better service	Public sector, governance, corporate learning, healthcare	Schuchmann (2015); Luna-Reyes (2014); Wang et al (2015)
Data driven business models	Strategic management	Wang et al (2015); Bharadwaj et al (2013)

2.1.3 Strategic change during digital transformation

Dimensions of digital transformation

There have been a number of attempts to conceptualise digital transformation. Lucas et al (2013) proposed seven criteria for understanding and comparing transformation, namely: changes in processes; creation of new organisations; changes in relationships; changes in user experience; changes in markets; changes in customer base; and disruptive impact on market constituents. Berman et al. (2012) are more concise in their articulation of the dimensions of (successful) digital transformation as defining a new customer value proposition and transforming the operating model. The latter likely encompasses changes in organisation, relationships, processes and consumer-base, but perhaps neglects the context and disruptive impact on the broader market. This is addressed by Melville (2004) who conceptualise the ‘competitive environment’, and Lee (2004), who typologised firms affected by the disruptive technology by: the magnitude of the response; the domain in which they operate; and by the speed of adoption. They

concluded that firms using web technologies as communication channels and to form alliances were particularly successful in their transformation. The speed of adoption has been extensively discussed in terms of 'first mover advantage' ([Lieberman, 1988](#)), and more recently 'late mover advantage' ([Shankar, 1998](#); [VanderWerf, 1997](#)).

In the context of digital transformation, Chen et al ([2014](#)) and Matt ([2015](#)) argue that from a resource-based perspective IT investment does not confer sustained advantage over competitors, due to the relative ease of duplicating IT innovations. They suggest that leveraging skills and investments are more important to successful transformation.

As seen in Section 2.1.2, Mithas ([2013](#)) suggest that strategy differentiation can result in a sustained competitive advantage, but that its efficacy is largely dependent on the competitive environment. They conclude that high growth environments with low competition for profit encourage strategies to converge; whilst concentrated and turbulent markets will see firms innovate and diverge in search of competitive advantage. Due to a lack of empirical studies, most of the propositions are sparsely verified in a host of industries, not least the UK grocery market.

A point of contention among digital transformation literature to date has been around where digital strategy fits within a businesses' broader strategic goals. For Tamm ([2015](#)) the IT-strategy should be aligned to the overarching management strategy using 'Enterprise Architecture'. Bharadwaj et al ([2013](#), p. 473) suggests that: "Digital business strategy is different from traditional IT strategy in the sense that it is much more than a cross-functional strategy, and it transcends traditional functional areas (such as marketing, procurement, logistics, operations, or others)".

Bharadwaj et al (2013) argues for a change in the view of IT/digital strategy as 'functional-level', subordinate to business strategy, but rather a fundamental and shaping part of the overall management strategy, remarking that "[m]any firms are beginning to see the power of digital resources to create new IT capabilities and craft new strategies around new products and services". (Bharadwaj et al, 2013, p. 474). Sawy (2008) suggest that this is: "in sharp contrast to the traditional view in which IT strategy is seen as needing to be aligned with business strategy, which presupposes the notion of separate IT and business strategies." (Sawy, 2008, p. 513)

Kohli (2011) observed this in their study of oil and gas firm Encana, where the CIO restructured to produce a highly decentralised governance model allowing for close collaboration between business units and information systems teams. The extent to which this decentralisation is evident in the online grocery market is understudied.

When introducing new technologies, one question facing CIOs is whether to develop the capability in-house or buy the technology in from an external provider. Agarwal et al (2010) found that in the healthcare sector, systems are often developed in house due to their highly bespoke applications. This can be costly and demands highly skilled personnel to be successful. They expected that as markets develops, certified external providers would become the norm. In contrast, Tamm (2015) noted that Australian firm Retail Co's on-time, on-budget digital transformation had been driven by a 'buy not build' philosophy; whilst not becoming too dependent on any one external supplier. Kohli (2011) argued that outsourcing frees up resources allowing firms to be more responsive to market demands.

Another element of digital transformation that has received substantial attention is organisational learning; and how new capabilities are absorbed into business processes.

Organisational learning and developing capabilities

Schuchmann (2015) highlight the importance of board members being ready and willing to engage for digital transformation to be successful. They suggest that this must translate into a shift in thinking and behaviour patterns among teams and individuals. This observation was made earlier by Barley, for whom an accumulation of small changes in routines may ultimately lead to structural changes (Barley, 1986). Following on from Barley, 'enacted technology theory' and 'institutional theory' have been presented by social constructionists in opposition to technological determinism (Luna-Reyes, 2014). For Fountain,

it is an actors' [sic] in social, cultural, cognitive, and institutional structures that influences how technologies are implemented in organisations, rather than properties of the technologies determining their use and effect. (Fountain, 2001, p.22)

Swidler echoed this agency-centric encapsulation of an organisation, where actors draw upon a tool kit,

of symbols, stories, ritual and world-views [in order to] solve different kinds of problems. (Swidler, 1986, p. 273)

That is not to say that individual agents operate independently of their organisation and its embedded culture. Fountain (2001) argues that the behaviours and values of an organisation act as 'cultural frame conditions', which constrain learning and development. Schuchmann (2015) highlights the importance of these framing

conditions in promoting continuous learning and reflexivity among employees, with the ultimate goal of implementing innovation into the organisation. For Piccinini et al ([2015a](#)) the vital components of this reflexivity include: communication, goal setting, personnel development and participation.

Antagonism remains rife between technologically deterministic and socially deterministic perspectives in digital transformation. For technological determinists, the primary cause of change is the technology itself - in essence, success is determined by an organisation's capability in 'taming' the technology to its will. There is a sense of the technology being inevitable and superior, if only institutions could adjust quickly enough. Fountain critiques this 'systems analysis' perspective of 'institutional lag', declaiming:

to say that institutions 'lag' implies a normative judgment that actors and structures should adjust more swiftly and efficiently to technological advancement. The additional implication is that new developments in technology should always be adopted and as rapidly as possible. ([Fountain, 2001, p. 5](#))

As a proponent of a more social constructionist viewpoint, she further articulates that:

The logic of institutional theory invites us to reverse the causal arrow that flows between technology and structure to show the multiple and fundamental ways that organizational, political, and social mechanisms used by government officials influence the adoption, design and uses of the Internet. ([Fountain, 2001, p. 9](#))

It has been suggested that organisations are reflections of the perceptions and actions of their senior executives. If true, this suggests that the agency of non-executive employees is limited, even in the case of decentralised organisational structures ([Chen et al, 2014](#)).

Others, including Treviño et al ([2006](#)) argue for a bringing together and interplay of perspectives to further the understanding of organisational change in the face of technological transformation. These socio-technical and social theoretic perspectives are yet to be thoroughly tested in practice. The approach of this thesis will draw upon and develop these ideas in the context of online grocery shopping and the digital transformation of incumbent retailers. The unification of perspectives is partially addressed by the resource and dynamic capabilities literature. Bharadwaj et al ([2013](#)) considers 'organisational resources' as: physical infrastructure; human resources; and intangible resources - the latter could encompass customer relationships and orientation, the use of technology and information emanating from its use. Similarly, 'dynamic capabilities' articulates the ways in which firms can re-purpose their assets and capabilities to address new challenges and opportunities ([Schuchmann, 2015](#); [O'Reilly, 2008](#)). This acknowledgement of the interpretive flexibility of the technology and the strategy employed to capitalise on opportunities also points to a socio-technical perspective of digital transformation. The site of digital transformation considered in this thesis is the web – a socio-technical system comprised of human and non-human agents that can be thought of as a 'social machine' – co-constructed by its components ([Smart and Shadbolt, 2014](#)).

Matt (2015) proposed four dimensions underpinning digital transformation in business, accommodating both the social and technological aspects of digital transformation. The four dimensions were defined as follows:

- **Use of technologies** — a company's attitude towards and ability to exploit new technologies
- **Changes in value creation** — impact of digital transformation strategies on a firms' value chains, i.e. how far the new digital activities deviate from the classical business.
- **Structural changes** — variations in a firm's organisational setup, especially concerning the placement of the new digital activities within corporate structures.
- **Financial aspects** — these include an organisation's urgency to act owing to a diminishing core business and its ability to finance a digital transformation endeavour. Financial aspects are both a driver and a bounding force for the transformation.

The **use of technologies** dimension allows for flexibility in the use of technologies, whilst also encompassing dynamic capabilities and organisational learning.

Changes in value creation facilitates discussion around changes in consumer and retailer behaviour; and how technologies interplay with innovation and change in services, products and outcomes.

Structural changes can encompass the potential shift in the relationship between digital / IT strategy and the broader management strategy; but also allows interrogation of the ways in which the norms and values of an institution shape behaviour and processes.

Financial aspects allow for a discussion of the competitive environment; market entry point; and the classical measures of financial performance.

Missing from Matt (2015)'s model are concrete examples of each dimension and those limiting cases that separate one firm or industry's digital transformation from another. The authors themselves call for this work and include in their call a problematisation of the appropriate level of digitisation. This builds upon the insights of Kohli (2011) and Fountain (2001), who challenge the dominant rhetoric that digital transformation (done correctly) is always the preferable path.

This thesis will thus look to build on Matt (2015)'s dimensions, responding to the call for real-world examples of the dimensions of digital transformation, whilst also challenging the limitations of the framework and proposing extensions to the model.

Table 2.3 summarises the key strategic digital transformation literature. The theoretical perspectives highlighted in this literature are discussed further in Chapter 4, where the methodological approach adopted in thesis is outlined in detail. The next section reflects on the outcomes of digital transformation, including how digital transformation can be measured.

Table 2.3: Strategic change in digital transformation – relevant to RQ2

Strategic change	Field(s)	Example(s)
Up-skilling required - especially as digital advantage is short lived / easy to replicate	Public sector/governance, information systems (healthcare), strategic management	Bharosa et al (2013); Agarwal et al (2010); Tamm (2015); Setia (2013); Chen et al (2014); Schuchmann (2015)

Culture change required, to focus on transparency, inclusiveness and receptiveness. IS roles changing scope	Public sector/governance, strategic management	Janowski (2015); Tamm (2015)
Decentralisation of decision-making / data driven decisions	Information systems, strategic management	Loebbecke (2015); Wang et al (2015)
Unification of processes, communications, marketing	Strategic management	Bharadwaj et al (2013)
Arguments for change from view of IT strategy as functional-level (subordinate to business strategy) to holistic digital business strategy	Strategic management	Tamm (2015); Wang et al (2015)
Systems often developed in-house in order to be sufficiently tailored	Information systems (healthcare), retail	Agarwal et al (2010); Hansen and Kien (2015)
Likely to outsource to certified external providers in the longer term	Information systems (healthcare),	Agarwal et al (2010)
Buy not build	Strategic management	Tamm (2015)
Digital transformation is achieved by changing: Operating model item Customer value proposition	Strategic management	Berman (2012)
Initial financial outlay required	Public sector/governance	Bharosa et al (2013)
Relationships with stakeholders changing - consumer connectivity and input higher	Public sector/governance, retail	Luna-Reyes (2014); Hansen and Kien (2015)
Development is consumer-centric	Organisational learning	Schuchmann (2015)
Efficiency must be balanced against innovation	Organisational learning	Schuchmann (2015)
Companies face common pressures from customers, employees and competitors to begin or speed up their digital transformation	Strategic management	Westerman (2011)
Differentiating from global competition important	Strategic management (manufacturing)	Buschmeyer et al (2016)
Omni-channel, allowing customers to shop across platforms a priority	Retail	Hansen and Kien (2015)

2.1.4 Outcomes of digital transformation

Measuring the impact of strategic change has long presented a challenge to industry and academics alike. Reasons for the challenges include:

- difficulty isolating a strategic change from the wider activities business and from the market conditions;
- lack of transparency in reporting; and
- strategic goals may not be focussed on short-term financial gain, playing out over a number of years.

Measuring the outcomes and impact of digital transformation brings with it a new set of variables such as IT capability; IT infrastructure; IT resources; intangible B2B and B2C relationships; and a limited understanding of how these factors interact to produce value ([Bharadwaj et al, 2013](#); [Jean, 2007](#); [Gounaris, 2005](#)).

Historically, business performance following a strategic change has been measured using return on investment (ROI), return on assets (ROA) or return on equity (ROE) ([Chen et al, 2014](#)). Performance can also be considered from a shareholder perspective, where economic profit/economic value added (EVATM) and earnings per share provide measures of long-term value.

Gu and Jung ([2013](#)) highlight that financial metrics alone may not give an accurate picture of the robustness or longevity of an organisation's strategy, arguing that dimensions such as quality, efficiency, human resource management and capacity for innovation may prove more informative for strategic leaders ([Bilalis et al, 2006](#)). In the

case of IT investment, Strassmann (1997) has gone as far as to suggest that there is no relationship between firm profitability as measured by ROE and ROA. It has been suggested that the emphasis should shift away from IT spending towards measures that evaluate how information resources, people and IT practices drive performance following digital transformation (Chen et al, 2013).

Overby (2017) argues that the digitally enabled marketplace is changing too quickly for long-term KPIs to be meaningful. As Grant (2017) remarked, traditional KPIs feel good but don't really give you a good view of whether your business is healthy or in trouble. Overby (2017) instead identifies the importance monitoring the effects of transformation in real-time. This resonates with the move across many industry sectors towards agile deployment. As Schuchmann (2015, p. 38) articulate:

[it is no longer] sufficient to undergo long development processes with a flawless product or service in result.

Skinner (2017) articulates that digital transformation is similarly a continuous improvement initiative. As much about changing mindsets and behaviours as it is bottom-line results. But cultural shifts are difficult to measure. Lindberg suggests that a decrease in the number of calls regarding technical problems and complaints; and an increase in the number of calls relating to seeking advice and information about products as signs of successful digital transformation (Lindberg, 2017). For Berman (2012), successful digital transformation is achieved by reshaping the customer value proposition and transforming operating models. Goersch (2002) also situates consumers at the centre of successful transformation when integrating digital channels, “the goal of multi-channel integration must be to provide a superior customer experience that is consistent and seamless across channels”. (Bharadwaj et al, 2013, p. 476) also highlighted the importance of timeliness in interacting with consumers as fundamental

to success. A slow response could mean customers moving away from companies perceived as being out of tune with the new reality. Piccinini and Gregory (2015b) suggest that the increased orientation towards customer service is self-perpetuating in that employees become more proactive in helping customers. Westerman (2011) identified the automation and centralisation of tasks facilitated by digital transformation as key to improved relationships with customers. The importance of customer relationship management is also cited by Setia (2013), who claim that 40% of customers who experience poor customer service will cease using the product.

Westerman (2011) suggests that successful digital transformation is driven by the CEO, whilst for Kohli (2011), a close working relationship between CEO and CIO is fundamental. According to PMI (2014), the most frequent causes of organisation change failure were ineffective communication and poor leadership. Buschmeyer et al (2016) highlights Stegmaier (2014)'s assertion that a major cause of change failure is underestimating employees' behavioural adjustment period.

Piccinini and Gregory (2015b) suggest that successful change requires shifts in thinking and behaviour - radical changes that demand a new set of competencies among employees. Akin to these observations Westerman (2011) claims that whilst digital technologies are allowing organisations to gather copious and detailed consumer information, they lack the analytical skill to understand the data and changing consumer behaviour Piccinini and Gregory (2015b).

Whilst there have been sustained attempts to understand digital strategic change, the field is still nascent. As Hansen and Kien remark regarding omni-channel strategies,

“[a]chieving success with an omnichannel strategy is a challenging endeavour that remains poorly understood.” ([Hansen and Kien, 2015](#), p. 52). Buschmeyer et al ([2016](#)) calls for empirical evidence of the impact of ‘instruments to influence behaviour’ on economic success, whilst Morakanyane, ([2017](#), p. 3) demand an “extension of literature that describes and articulates the phenomenon of digital transformation; what it is; how it behaves; what drives it; what impacts it creates, as well as where the impacts are felt”.

Furthermore, whilst there is an allure in collecting ‘big data’ at every stage of digital interaction, the skills to understand and interpret this data remain sparse. Hansen and Kien ([2015](#)) suggest that the value of (consumer) data lies in replacing what it claims is high quality (but expensive) data obtained via sampling and extrapolation with the vast quantities of automatically collected data now amassed. It is proposed that by collecting large amounts of data, the dataset will tend to the population such that it surpasses the value of small high-quality datasets, even if the data itself is noisy. The assumption is aligned with the concept of economic rationality in that it assumes that if only we had all information about users, we would understand everything. Evidence suggests that this is still not the case. We have not resolved the complexity of human thought, motivation and action by merely collecting more data. Quantitative approaches adopt an inherently retrospective view of behaviour. Counting who and how much of each product each user purchased may prove predictive in future consumption, but alone, they do not reveal the processes and compromises that took place in compiling a shopping basket. Imagine that a customer really wanted sheep’s milk but had to buy soy milk because the store didn’t stock sheep’s milk. Perhaps eventually this customer might stop shopping at the store and move to a store offering the product they wanted. Counting sales of soy milk would have no predictive or explanatory capacity. An appreciation of the individual as an interpretive, reflexive actor may prove more instructive.

Among the digital transformation literature summarised in [Table 2.2](#), [Table 2.3](#) and [Table 2.4](#), only one study referred to the digital transformation in the grocery industry and none to online grocery shopping specifically. This thesis will address the distinct lack of literature regarding digital transformation of grocery retailers, particularly entering the UK's online grocery market.

This thesis will look to contribute to the maturation of this body of literature focussing particularly on the 'drivers', 'strategic changes' and 'impacts' or 'outcomes' of digital transformation in the UK's online grocery business whilst also building the case for considering consumers and retailers as creative agents in the change process.

Table 2.4: Outcomes of digital transformation – relevant to RQ3

	Outcome	Field(s)	Example(s)
<i>Communication</i>	Changing way patients engage with their healthcare and altered patient-clinician relationships	Information systems (healthcare)	Agarwal et al (2010)
	Effects on relationship with consumer	Public sector/governance	Janowski (2015)
	Transparency and better communication	Public sector/governance	Luna-Reyes (2014)
<i>Financial, market environment and strategic</i>	Time and cost-saving flow of information; easier to perform analytics	Public sector/governance	Bharosa et al (2013)
	Reduced cost, improved integration; profits doubled in 5 years	Strategic management	Tamm (2015)
	Current concerns around integration into work-flow, [patient] safety. Lack of studies into features of successful implementation.	Information systems (healthcare)	Agarwal et al (2010)
	Technology disrupts existing routines	Healthcare	Edmondson et al (2001)

Firms develop their operational, dynamic, and improvisational capabilities, improved performance	Strategic management	Mithas (2013)
Business models have changed from product centred to service centred	Strategic management (manufacturing)	Buschmeyer et al (2016)
77% companies (healthcare) don't have clear big data strategy	Information systems, strategic management	Melville (2004); Wang et al (2015)
Improved success rate in transformation and competitiveness	Strategic management (manufacturing)	Buschmeyer et al (2016)
Normative pressures can cause firms to converge or diverge, imitate	Strategic management	Mithas (2013)
Oligopoly / contraction of market; erosion of property rights, automation of some jobs, creation of others	Information systems	Loebbecke (2015)
Competition discount: has never been higher, compromise discount: has never been higher, uncertainty discount: has been virtually eliminated; enhanced choice but also consumer frustration and consumer empowerment	Information systems	Lucas et al (2013)
Increased productivity, profitability, competitive advantage	Information systems	Stielglitz (2012)
ROIs of global campaign launches 10 times better than before; sales and turnover increased	Retail	Hansen and Kien (2015)
Negative impact of greater industry benchmark information-facilitates shopping around; efficiency, effectiveness, cost saving	Strategic management	Chen et al (2014)
Can result in implementations of new leadership roles and governance that facilitate rapid digital transformation.	Retail	Hansen et al (2011)
Some gas and oil firms have gone for a 'digital transformation lite' approach with increased supply chain visibility and lowered exploration, drilling and delivery costs.	Management information (oil industry)	Kohli (2011)
Successful digital transformation does not happen bottom up. It must be driven from the top.	Strategic management	Westerman (2011)

	Governance has been decentralised	Management information (oil industry)	Kohli (2011)
	Major digital transformation initiatives are centred on re-envisioning customer experience, operational processes and business models	Strategic management	Westerman (2011)
<i>Data, information and technology</i>	Improved information leads to higher customer orientation and customer response capabilities among customer services units	Information systems	Setia (2013)
	Efficiency IS have been outsourced, strategy kept in house	Management information (oil industry)	Kohli (2011)
	Gain useful knowledge to support better decision-making, to predict customer behaviour via predictive analytics software, and to retain valuable customers by providing real-time offers.	Information systems	Setia (2013)
	Inter-operable, competitive systems	Strategic management	Wang et al (2015)
	Due to advances in digital technologies, producers can readily access consumer knowledge about their products and services through different channels	Information systems (automotive industry)	Piccinini and Gregory (2015b)

2.2 Summary of gaps in the digital transformation literature and derivation of RQ1-RQ3

This literature review has shown that the work to date can be broadly divided into studies relating to the drivers (and barriers) to organisational digital transformation; the strategic changes that take place during digital transformation; and the outcomes of digital transformation. This thesis will address the shortfalls in the existing literature in each of these areas, focusing on the paucity of work relating to the UK's grocery market

and the plight of traditional retailers entering the online grocery market. The first three research questions, relating to the digital transformation of the UK's grocery market are defined as follows:

- **RQ1:** What are the drivers (and barriers) to entry in the UK's online grocery market?
- **RQ2:** What strategic shifts occur when traditional supermarket retailers undergo digital transformation?
- **RQ3:** What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

[Table 2.5](#) summarises the gaps in the existing literature regarding the digital transformation of the UK's grocery market, as identified in Section 2.1 and shows how RQ1-RQ3 will approach addressing these gaps.

Table 2.5: Gaps in the digital transformation of the UK's grocery market literature

Gap(s) identified	This thesis...
Digital transformation of the UK's grocery market as a whole	How RQ1-RQ3 address the gap(s)
Digital transformation in the UK's online grocery market is unstudied. Only found one grocery related digital transformation paper, none relating to online grocery shopping.	<ul style="list-style-type: none"> • Considers UK online grocery market primarily through an in-depth case study. • looks more holistically at the UK's online grocery market and (using a web science approach) how socio-technical constraints affect the market and the individual retailers within the market.
Drivers of (and barriers to) digital transformation	How RQ1 addresses the gap(s)
Conflicts between authors / sectors have emerged particularly with regard to whether factors are incentives or disincentives for retailers undergoing digital transformation. The dominant positions are summarised in Tables 2.1 and 2.2.	<ul style="list-style-type: none"> • Assesses the drivers of and barriers to entry for important UK case study Morrisons. As the fourth largest supermarket in the UK, Morrisons' late market entry facilitates insight into how the drivers and barriers to entry in the UK's grocery market interplay with their efforts to undergo digital transformation.

Strategic change for retailers undergoing digital transformation	How RQ2 addresses the gap(s)
<p>Dimensions of digital transformation have been suggested, e.g. (Matt, 2015), but the community calls for empirical evidence and limiting cases to be established.</p>	<ul style="list-style-type: none"> • Uses a socio-technical web science approach to propose a powerful diagnostic model for assessing technological change; building on Matt et al's 'four dimensions of digital transformation'. • This model is used to highlight the opportunities and challenges faced by retailers in the UK's online grocery market.
<p>Limited understanding of the dynamics between human and non-human actants in digital transformation strategies.</p>	<ul style="list-style-type: none"> • Uses a web science approach to introduce the concept to social machines to digital transformation theory.
Outcomes of digital transformation	How RQ3 addresses the gap(s)
<p>The role of human and non-human agents in shaping technology use has been proposed, but there remains little evidence of how this has manifested itself in digital transformation processes to date.</p> <ul style="list-style-type: none"> • difficulty isolating a strategic change from the wider activities business and from the market conditions; • lack of transparency in reporting; and • strategic goals may not be focussed on short-term financial gain, playing out over a number of years. 	<ul style="list-style-type: none"> • Uses qualitative methods and a web science approach to consider consumers and retailers as creative agents in the change process. • Leverages unprecedented access to real-world transaction data to model the outcomes of digital transformation of Morrisons – the fourth largest grocery retailer in the UK. Uses mixed-methods approaches to show how this relates to the UK market as a whole. • Uses several years of transaction and financial data; alongside qualitative findings from interviews to triangulate the outcomes of digital transformation; and to isolate 'intentions' from 'outcomes'.

This chapter has critically analysed literature regarding organisational digital transformation and has concluded that relatively little known about the drivers, strategic changes and outcomes of digital transformation, particularly with the UK grocery market in the online era. In response, this chapter shows how the first three research questions were derived (RQ1-RQ3) and has shown how these will be used to address gaps in the existing literature. Chapter 3 considers digital transformation from a consumer perspective, looking at what is known about the characteristics and practices of offline and online consumers.

3. Literature review and research gaps: consumers and consumption

This section looks at what is known about who online and offline consumers are; how they vary; what strategies they employ; what drives them, what is important to them and what affects how they shop.

- Section 3.1 **Consumer demographics** considers the literature to date relating to the characteristics of online and offline shoppers and how this impacts shopping practices.
- Section 3.2 **Consumer skills and preferences** considers extant work on online and offline consumer preferences and behaviours; and considers the interaction of consumers and technology.
- Section 3.3 **Summary of gaps in the consumer and consumption literature and derivation of RQ4** outlines the gaps in the consumer practices literature and explains how the fourth research question addresses these gaps.

3.1 Consumer demographics

Gendered and household consumption

Gender has featured heavily in the assessment of consumption, particularly in the fields of sociology and anthropology. Glennie ([1996](#)) suggested that the changing role of women in the home and workplace has been perhaps the most significant factor in the reconstitution of the family as a unit of grocery consumption.

Women made up 29% of the UK workforce in 1900, but this had risen to 46% by the beginning of the twenty-first century ([Lindsay, 2003](#)). This has led to increased time constraints on women's traditional provisioning roles, in what sociologists have referred to as 'time poverty' ([Wajcman, 2014](#)), and delayed childbearing. Fertility among mothers aged 35 and over surpassed the rate for those under 25 for the first time in 2014 ([McLaren, 2015](#)). Other significant changes have been the increase in young adults living away from the parental home, an increase in divorce/separation, and an aging population. These factors have all contributed to an increase in single-person households such that the homogeneity of the nuclear or extended family unit as the primary consumer has been disrupted ([Joseph Rowntree Foundation, 2006](#); [ONS, 2010](#)). It has also been suggested that the heterogeneous composition of modern families, or 'cohabitants' has resulted in homes in which, people

[are] united not by ties of blood and affection but by economic exchange ([Mcdowell, 2007](#)).

Negotiation and renegotiation of gender roles was a key feature of the twentieth century, which saw the emergence of the 'companionate marriage' ([Young, 1973](#)) in which men and women assumed equal share of household chores ([Bowlby et al, 1997](#); [Mcdowell, 2005](#)). In accordance with Lowe ([2002](#)), Bowlby et al et al suggest that it is not only social boundaries that are traversed in the negotiation of gender roles:

Challenges to socially accepted versions of gender often involve the transgression of spatial as well as other boundaries within the home, for

example, the woman in the toolshed [sic] or the man in the kitchen et al.

([Bowlby et al, 1997](#), p. 346)

They further suggest that the introduction of online grocery shopping via mobile or tablet device, the act of grocery shopping becomes readily available to either gender, without disrupting their gendered use of space within the home. The grocery shopping could be done in the shed; the kitchen et al; or on the sofa, watching the football. This leads to the question of whether the portability of grocery consumption has affected the demarcation of gender roles in modern households.

The twentieth and twenty-first centuries have seen several revolutions in grocery retailing that have shaped and been shaped by the dynamics of family life. Retailers were experimenting with a new grocery store format in the 1910s - the self-service open-shelf store ([Blanke, 2002](#)). Prior to the introduction of self-service, customers were served at a counter and the proprietor was responsible for retrieving and weighing out products. Prices were rarely displayed such that negotiation was a key component of the retailer-consumer exchange. Prior to the introduction of self-service, shoppers were active consumers, expected to haggle with, threaten, praise, cajole, or shame the grocer, as circumstances warranted ([Deutsch, 2010](#), p. 2). The introduction of self-service - whereby products were presented in open-shelves and with fixed prices led to a fundamental collapse of this dyadic communication.

The allure of self-service for the retailer was clear - customers could be processed in greater volumes, at greater speed and with fewer staff than ever before ([Hamlett et al, 2008](#)). What then was the motivation for the consumer? By accepting the self-service model, consumers apparently relinquished their agency in negotiating price; forwent individual customer service; and took on more work negotiating with an array of pre-weighed goods. Time efficiency and choice (and thus potential savings) emerge as the

most plausible motivators ([Shaw, 2004](#)), but an examination of the socio-economic climate of early twentieth century USA offers insight into why choice and price have emerged as dominant drivers of grocery consumption.

The US experienced a period of hyperinflation following its involvement in World War I. As prices continued to rise, so did mistrust in grocers perceived to be artificially inflating prices ([Deutsch, 2010](#)). Amid continued discontent, the blame for exorbitant prices was also directed at women. As the primary shoppers they were responsible for negotiating the price of goods. It was therefore asserted that women must be failing in their role to keep prices down.

Self-service pioneers seized upon this opportunity to advertise to women, purporting to offer the (female) consumer autonomy and independence. This was seen as preferable, even if it meant relinquishing the bargaining power and personal attention previously afforded. Agency exhibited in choosing between products, or indeed stores, allowed women to reassert their control over the shopping and prove prudence in their decision making,

[a]s purchasing agents, women could command respect for exhibiting qualities previously honored primarily in men – capacities for planning, efficiency, and expert decision-making. ([Marchland, 1985](#), p.168)

Piggly Wiggly, the brain child of Clarence Saunders, claims to have opened the first self-service store in 1916, although several grocers were experimenting with the idea across the US. Open shelving allowed consumers to compare and contrast products which were presented in uniform weights and were assigned fixed, advertised prices ([Dowling,](#)

[1993; Stobart, 2012](#)). Competition between brands, who now had to fight for the attention of consumers led to a rapid rise in the importance of advertising, brand loyalty and product differentiation that still define our relationship with products and retailers today ([Mintzberg and Waters, 1982](#)).

The economic boom of the 1950s and 60s marked an improvement in the quality of life for families across the UK, but also highlighted the disparity in pay and rights between men and women. Women's rights activists became increasingly active throughout the 1960s, culminating in the first National Women's Liberation movement who demanded equal pay, help with childcare and protection from domestic violence. By 1975 there were purportedly over 1,500 women's liberation groups who met on a regular basis ([Cochrane, 2010](#)). Women hosted strikes, marched and lobbied for reform resulting in the passing of the Equal Pay and Statutory Maternity provision Acts in 1970 and 1975 respectively.

The 1950s and 60s also saw the emergence of a new life-stage in the UK, that of the 'teenager' which we have seen transition into 'Millennials' in the twenty-first century. Whilst young people had previously transitioned from childhood directly into adult roles and responsibilities, increased disposable income and prolonged compulsory education afforded young people the opportunity to develop their own cultural identities. Increased income also meant that young adults could afford to move in to their own homes at increasingly earlier ages marking a departure from the nuclear household. By the 1980s and 90s traditional views on homosexuality, divorce and single-parent families were also changing resulting in a diversification of the format of the household as a unit of consumption ([Turner, 2013](#)).

The emergence of online grocery shopping had its origins in 1984, when Mrs. Jane Snowball of Gateshead, England purchased groceries from her local Tesco store using Videotex ([Winterman, 2013](#)). However, it would be another five years before the

World Wide Web was invented and it wasn't until the 2000s that online grocery shopping started to play a significant role in grocery consumption. Online as a channel of Grocery shopping is understudied particularly the transformation of family dynamics, our relationship with food and ultimately, our consumption behaviour. As articulated by Marwick ([1990](#), Chapter 4, para. 1):

We can allocate people to different social classes, we can allocate them to different regions of the country, but fundamentally life was everywhere lived as a member of a family.

With the enticement of an ever-increasing availability of consumer data, it is easy to underestimate the role of the household and other societal constraints in understanding evolving consumption behaviour. Harris et al ([2017](#)) found that regular online shoppers tended to belong to Mosaic groupings with high concentrations of families with children, whilst those social groupings with the highest proportions of poor and elderly shoppers were least likely to engage with online grocery shopping.

Despite the posturing of theorists that online shopping imbues a shift in gender roles of consumption, it has not been extensively explored in empirical literature. Findings have been inconsistent across studies to date - the proportion of females among online grocery shoppers has ranged from around a third to nearly three-quarters ([Sieber, 2000](#); [Kelloggs, 2015](#); [Hansen, 2008](#); [Rohm and Swaminathan, 2004](#)). This quantitative phase of this thesis explores the gender split of online grocery shoppers in the UK, whilst the qualitative phase contributes to our understanding of gendered consumption in the online era from the perspective of consumers.

Age of online consumers

Hwong (2018) found that whilst Millennials (those aged 18-34) constituted a third of the online shopping population in the US, they tended to be ‘light shoppers’, spending the least time per month shopping online. The heaviest shoppers were Generation X (those aged 35-54). Hwong characterised the ‘super shopper’ as a:

47-year-old woman with a household income under \$50,000 who spends 44 hours per month (nearly two whole days) shopping online. ([Hwong, Identifying the “Super Shopper”, para. 1, 2018](#))

Li et al’s (1999) earlier online survey of 981 active internet users found that users in the 40-49 age group were most likely to shop online regularly – 46% of respondents claimed to be frequent online shoppers. In contrast to Hwong’s reports, the under 21 and 21-29 age bands were not far behind with 37% and 38% reporting to be regular shoppers respectively. The sample was conducted among established and self-selecting Internet users however. This thesis looks at real transaction data and is less incumbered by this bias. This study was also conducted early in the life of E-commerce and may more accurately reflect the demographics of ‘early adopters. Sieber’s survey of 1,003 online grocery customers in Switzerland in 2000 found that nearly three-quarters were under 39 ([Sieber, 2000](#)).

According to Gallup, the picture was different among online grocery shoppers in the US in 2017. Gallup reported that 15% of 18-29 years olds in the US reported to doing online grocery shopping at least once a month, higher even than the 12% of 30-49 year olds ([Redman, 2018](#)). Older consumers are generally underrepresented in online grocery shopping surveys to date, although reports from the Taiwanese government and

the Pew Internet & American Life Project 2010 have noted that the growth in online users is greatest among older users and that their 'online skills' are becoming more sophisticated ([Lian and Yen, 2014](#)).

This thesis will contribute to the understanding of the demographics of the UK's online grocery market by exploring the characteristics and purchasing behaviours of hundreds of thousands of customers from the UK's fourth largest grocery retailer.

Location of consumption

The invention and proliferation of web technologies has facilitated a relocation of (grocery) consumption from the physical store to 'potentially anywhere'. Crewe and Lowe ([1995](#)) discussed spatial heterogeneity in terms of 'micro-geographies of consumption' where they argued that retailers create highly individual consumption spaces, quite apart from the perceived 'McDonaldisation' effect ([Ritzer, 2011](#)). This homogenisation has been similarly debated around the proliferation of the web. The implications of consumption that happens anywhere entails that consumption depends not only on the virtual space that is the web interface, but also on the diverse array of physical spaces in which the consumption takes place.

In focus group discussions with online shoppers, Michaud Trevinal ([2014](#)) found that many respondents enjoyed the affordances of being in a familiar, relaxing environment when shopping online. This was consistent with the reports of TCC Global's Global Insights Director Bryan Roberts ([2007](#)), who noted that one of the main drivers for the adoption of e-commerce was that home delivery negates the need to travel to a store (2017).

Users have been reported to particularly value the capacity to move between tasks and research items on different websites. The appeal of this ability to multi-task was also reported by Robinson et al ([2007](#)). They conducted focus groups with 32 online grocery shoppers and found that respondents rarely purported to having a regular time or place for shopping,

...sometimes from home, sometimes from work, other times in the middle of the night. ([Robinson, 2007](#), p. 98)

Gregson and Lowe remarked upon a tendency among geographers (and social theorists) to consider location as a metaphor for a sense of belonging ([Gregson and Lowe, 1994](#)) and on the seeming reluctance to interrogate the role of physical spaces as structuring resources - as if to do so is reductionist. McDowell extended this observation, highlighting the difficulty in interrogating the duality that is 'the home':

If place, the locality, is defined not as a bordered container but a locus of exchange and interactions across different spatial scales (Massey 2005), how should we now define the home as it is both the site and the locus of multiple forms of interchange, both 'real' and virtual, between people who are both physically present and absent at different times? ([McDowell, 2007](#), p. 134).

The complexity and variation in a consumer's interaction with their physical space takes on a new dynamic, largely unarticulated in literature around (online) grocery consumption. This thesis looks at socio-demographic variation in consumption in the quantitative phase, but also utilises focus-groups with consumers to understand how customers engage with physical and virtual space when grocery shopping.

3.2 Consumer skills and preferences

Price-sensitivity and thrift

Wang et al's 2015 study of around 16,000 consumer activities on a US-based online grocery platform represents the most comprehensive online grocery shopping study to date ([Wang et al, 2015](#)). The study used real-world data to examine the effect of mobile use on consumption behaviour. They found that consumers using mobile devices for online grocery shopping increase in value over time, ordering more frequently as they become accustomed to the technology and interface. They also suggested that engagement with m-shopping resulted in low income consumers spending more than they previously did in-store. We are not aware of any study of this scale looking at UK audiences, a shortfall addressed by this thesis.

Grocery shopping literature has long focussed on consumers' ability to publicly exhibit good economic sense, or 'thrift', as articulated by Miller ([1998](#)). There have been numerous claims that the nuclear family and 'bread winner ideology' has been replaced by an 'individualistic ideology' ([Mcdowell, 2005](#), [Simmons, 2008](#)). Miller noted that the expression of individuality in grocery shopping is expressed through the temporary abandonment of thrift:

That which the shopper does on behalf of the household is governed by thrift, while their individual presence is signified by the treat. ([Miller, 1998](#), p. 48)

If we take Miller's observation to be true, then one might suppose that an increased sense of individualism and the asocial nature of shopping on a personal device (as opposed to pushing a trolley around a supermarket with family members) might lead to a higher propensity to treat oneself. Anecdotal evidence provided by a Morrisons employee in 2016 suggested that this is not the case - that in fact online grocery shopping is used as a tool for planned, thrifty shopping and that it is the physical convenience stores that are frequented to top-up on the treats that one tried to abstain from in the weekly shop. According to Roberts (2017), consumers claim that it is easier to budget and plan online and easier to stick to avoid temptation.

Robinson (2007) also found evidence of thrifty behaviours suggesting that users place orders less regularly to justify the cost of delivery charges, but that baskets may also be correspondingly bigger, as to diminish the marginal cost of delivery. Despite this, Huang (2006) found that physical distance from the supermarket was a more important predictor of tendency to shop online than delivery charges. This was consistent with the findings of Briesch et al (2009), who found distance to travel has a larger effect on retailer selection than price or product assortment. Briesch et al (2009)'s offline study of 11,005 store visits did however indicate that retailers with more brands increased their probability of a household choosing their store, but that those with fewer stock keeping units (SKUs) per brand also attracted greater loyalty.

In the online context however, where distance is removed as a variable among online retailers, price and product variety may play a larger role in choice of retailer. Contrary to retailer's fears that price comparability online would spark intensified price competition, Degeratu et al (2000) found that online consumers may not be as price-sensitive as the general population. It should though be noted that the online and offline groups were distinct. Despite attempts to choose similar demographics across the two groups, this does raise the question as to whether variation between channels could

merely represent differences inherent in the online and offline groups ([Chu et al, 2008](#)). Studies to date showing multi-channel shoppers spend more than single channel shoppers have typically centred on a single product category ([Anesbury et al, 2015](#)). Kushwaha and Shankar ([2013](#)) looked at multiple categories and concluded that product category affected this tendency, although notably absent from their categories was grocery shopping.

The role of economics and thrift have been widely discussed with respect to grocery shopping prior to the proliferation of the web. In his 1998 book, 'A Theory of Shopping', Miller claimed that the primary reason for consumers purchasing items not on their shopping list was in order to take advantage of marked down products ([Miller, 1998](#)). The architecture of the website may play a role in the extent to which offers feature in the online grocery basket - on the one hand, 'favourites' baskets might tend to prevent consumers from choosing 'on offer' products; on the other hand, the opportunity for retailers to push offers in front of them is vastly increased. How shoppers express and reflect on their skills in thrift may also be altered by the new online context - home deliveries eradicate the constraint of not being able to carry bulky items in the shopping trolley, for example. Miller asserts that a wide product range can aid consumers in feeling they have been 'thrifty',

Virtually all shoppers, whichever strategy they choose to follow, can legitimate that choice on the grounds that they have made a saving. ([Miller, 1998](#), p. 53)

This suggests an actor's ability to rationalise any decision is a form of self-deception not contiguous with a sound economic judgment. Jean Lave is rather more generous in her

assessment of the skills and creativity of the consumer. She problematised the ‘economic rational actor’ in her 1988 book ‘Cognition in Practice’, in which she observed how consumers structured their grocery shopping decisions by calling upon socially contingent as well as purely arithmetic resources. She highlighted the importance of context on the strategies employed, exposing the vast difference in approach to the hypothetical problem, ‘what would you do if ...’; and the techniques actually employed when presented with the same real-life scenario. Her study exposed a rich tapestry of resources and factors affecting purchasing decisions not readily encapsulated by the economic assumption that actors who do not choose the most financially sound choice are, by definition, irrational.

In an earlier study, Rogoff ([1984](#)) showed how everyday mathematical reasoning, as a ‘cognitive technology’, worked in grocery shopping. With the web, ‘home maths’ is no longer necessarily taken to the supermarket, rather the supermarket is brought into the home. Given the new context and Lave’s assertion that consumer strategies are context-dependent, there is scope to identify whether online-only and hybrid grocery consumption activities reveal new consumption strategies. This draws upon the insights of Giddens, Bourdieu and Habermas, who conceptualise a world in which actors draw upon resources to enact agency but are also shaped by the structures in society. For Habermas, these structures are the oppressive realities of capitalism resulting in ‘social pathology’ ([Harvey Brown and Goodman, 2001](#)). Giddens’ encapsulation is rather more positive – he proposes that the structures which guide human action are socially constructed by the agents themselves.

Time-poverty

Twenty-first century families, particularly ‘working mothers’ are often referred to as ‘time-poor’ ([Wajcman, 2015](#)) and time is often cited as the primary reason for online

shopping. This was supported by the findings of ([Anesbury et al, 2015](#)), who reported that online shoppers spent a matter of seconds selecting each product, akin to offline findings ([Cobb and Hoyer, 1985](#); [Dickson and Sawyer, 1990](#)). They concluded that there was little evidence of a change in behaviour between online and offline shopping in respect of time. They also noted that very few customers made use of the customisation options for displaying products, preferring to use the 'search bar' and default product layouts. This study did however rely on an artificial shopping environment where consumers were asked to purchase a list of items and did not have to pay for the shop, thus undermining the realism of their shopping behaviour.

Time poverty has not been universally reported in studies to date. Whilst ([Robinson, 2007](#)) found that regular shoppers had reduced their shop time to minutes, facilitated by features such as 'favourites', Michaud Trevinal ([2014](#)) described how users' propensity to multi-task meant that online shopping was done over an extended period.

Furthermore, Huang ([2006](#)) found no evidence to support time being a factor of convenience for online over physical shopping. Roberts ([2017](#)) suggested that customers valued being able to shop at any time of the day and the 'perception' that it took less time than shopping in-store. This observation alludes to consumers valuing time at home above than in-store, even if in absolute terms the shop was no quicker.

Rohm ([2004](#))'s online shopper typology cites four distinct user types and may help account for disparity in findings regarding time and price-sensitivity. Rohm and Swaminathan's 'convenience' motivated group were the most likely to engage in online shopping. Their characteristic attributes included lower requirement for variety (across retailers) and lower sensitivity to receiving products immediately than the supermarket

shopping population at large. The use of ‘favourites’ and site search will be scrutinised in this study to contribute to this debate.

Trust and basket composition

Another common theme emanating from previous studies is the lack of trust associated with purchasing fresh produce online. It has been found that consumers are worried about substitutions, the shelf-life of perishable goods and sub-optimal selection of fresh produce ([Hand et al, 2009](#)). As a result, it has been reported that many online grocery shoppers continue to visit physical stores to purchase fresh food items. This could have implications for all food stuffs, but particularly ‘fresh’, where customers usually rely on sensory perception to evaluate items. This may imply a tendency to opt for branded, pre-packaged fresh goods. Nielsen’s global survey ([2015](#)) found that 59% of European respondents said they would not consider buying fresh and household produce online. This study will add to this debate by comparing online and offline consumption of perishable and non-perishable goods.

Device and channel preferences

As we move into an era where technological interfaces form the basis of many of our social and commercial activities, consumer behaviour has acquired a further layer of complexity ([Keifer, 2013](#)). Increased reliance on the web could be transforming grocery shopping - including our relationships with food and our roles within the household. Questions also arise about the design and effects of online interfaces themselves.

Maity ([2014](#)) found that the channel of consumption affected decision making and propensity to buy. Respondents preferred shopping in-store to on mobile devices, which the authors attributed to mobile phones low ‘media richness’. The convenience of e-commerce (via a desktop/ laptop device) outweighed the lower media richness

compared to in-store, rendering it the most popular channel overall. Wang et al's study of mobile shopping (m-shopping) indicated a tendency to opt for branded or 'known' products due to the constraints of the small screen size making it harder to research and evaluate new items ([Wang et al, 2015](#)).

The 'digital divide' and accessibility

Vass and Davis, reflecting upon the transportation of values via colonialism, argues that,

[t]o suddenly impose a particular model of the family on another culture with a fundamentally different form of social organisation is to begin to erode any locally derived abilities. ([Vass and Davis, 1996](#), p. 133)

This erosion of abilities can also be seen in the 'digital divide' debate ([Warschauer, 2003](#)). The movement of government administrated services such as car tax to a predominantly online or online-only makes good financial and administrative sense for the government, but leaves many older, cognitively impaired or 'technophobic' individuals bereft of the resources they had complete the mundane task of paying car tax. Indeed, one might conceive that to some extent, the adoption of a new technology or process deprives us all of the established resources and abilities we have developed. Hobson ([2003](#)) might describe this as moving the task into the 'discursive consciousness'.

The divide described in the 'digital divide' emerges in the resolution of this discourse. Users who are able to assimilate the process of say, online grocery shopping into their existing skill set sit one side of the divide, whilst those for whom the process is too

alien, too disorienting or too much effort sit at the other. Of course, for some, it may be that the new context provides superior resources. The agoraphobic, lacking in resources to negotiate a physical supermarket is likely to find the prospect of online grocery shopping enabling and preferable. This conceptualisation of the context of technology adoption offers insights, reasons and understanding not offered by quantitative models such as TAM ([Bagozzi et al, 2007](#)).

Furthermore, the ease with which we as individuals adopt identities and skill-sets within different social contexts cannot be understood or meaningfully predicted by quantitative labelling alone. The phenomenon of individuals who are confident and competent users of IT in the workplace, but who are un-confident or unwilling users in the home also highlights the complexity of technology use and adoption ([Janneck, 2009](#)). In extending a model like TAM, this phenomenon would require iterative (and perhaps never ending) refinements of the model to include a new category of behaviour, e.g. ‘work user and not home user’. In isolation, this model would have no predictive potential to determine whether a user would be likely to use a new technology in a new context. In contrast, by understanding the resources and ‘enabling constraints’ with which an individual approaches new situations provides not only a depth of understanding unrivalled in TAM, but also imbues a far greater predictive potential and generalisable understanding of technology adoption.

Factors affecting technology adoption and loyalty

Attracting and retaining customers has always been of primary concern to retailers and with some estimating that a 5% increase in customer retention can lead to profit increases of nearly 100%, it is easy to see why ([Reichheld, 2000](#)). Rafiq ([2005](#)) found that offline interaction with the brand and ‘word of mouth’ recommendation online were the most important predictors of choosing and continuing to use the services of an online

retailer. They also found that market leader Tesco's success in gaining customers from other retailers was an exemplification of the 'double jeopardy effect', i.e. that those with lower market share also suffered lower brand loyalty. This effect was also shown to be true for individual products in Danaher et al ([2003](#))'s study of grocery shoppers in New Zealand. Dawes ([2013](#))'s analysis of Kantar Panel data indicated that loyalty to a single retailer was less (and falling) online; but that brand loyalty (including retailer own-brand products) was slightly higher online. Chu et al ([2010](#)) found that households were more brand loyal but less price-sensitive when shopping for groceries online than offline.

Harris et al ([2017](#)) found that 64% of a sample of shoppers who had tried online grocery shopping had shopped online within the last month, 32% had shopped online for groceries in the past 3-12 months and 5% had discontinued online grocery shopping altogether. In 2017, Nielsen reported that online grocery shoppers can be categorised as 'regular'; 'trialist' (those who have tried online grocery shopping but not recently); 'considerers' (those who have not tried online grocery shopping but are not against the idea) and 'avoiders' (those who will not consider buying groceries online). In their global survey, they found that around 5% of European shoppers fall into the regular category, 7% are trialists, 29% are considers and 59% are avoiders ([Nielsen, 2017](#)).

The majority of studies in Human computer interaction (HCI), psychology and market research analysis of online consumption have centred on brand-impervious motivations for technology adoption. Hansen ([2005](#)) postulates that online grocery shopping is a 'discontinuous innovation' requiring a significant shift in behaviour and thus a more drawn-out adoption period. Hand et al ([2009](#)) found that being adept Internet users was not sufficient to assume a propensity to engage with online shopping; and that when

online shopping was adopted, it did not usually entail the discontinuation of offline shopping ([Yu, 2007](#)). As noted by Harris et al ([2017](#)):

Schröder and Zaharia (2008) remark that it is misleading to distinguish between a ‘store oriented behaviour’ and ‘non-store oriented behaviour’, since there is evidence that consumers ‘choose where to make their purchase based on which channel is best suited to satisfy their motives’ (p. 462).

This isn’t to say that there aren’t differences between online and offline shopping practices, although Ganesh et al ([2010](#)) contest that there are more similarities than differences between brick-and-mortar and click-and-mortar shoppers.

Several studies have employed various incarnations of the Technology Acceptance Model (TAM). In one such study, Evanschitzky et al ([2004](#)) recognised the importance of context in the adoption of technologies. They identified the ‘human-to-human’ consumer-retailer interaction as having been replaced with ‘human-to-computer’ interaction as a key differentiator between offline and online customer satisfaction. They reported a moderately good fit with Szymanski and Heise’s findings concluding that some drivers of E-satisfaction may be context invariant ([Evanschitzky et al, 2004](#); [Szymanski and Heise, 2000](#)). TAM studies tend to be deployed in experimental settings and often require the intention to adopt a technology or behaviour, but do not assess the uptake or continued use of the technology. This is justified on the assumption of an ‘Intention-Behaviour’ link, i.e. the assumption that a customer’s reported intentions are played out in their subsequent actions. Bagozzi et al ([2007](#), p. 245) describes the link as probably the most uncritically accepted assumption in social science research. Bagozzi et al goes on to criticise TAM for its simplistic model of human action, which fails to recognise that engagement with a given technology or service is rarely a ‘terminal goal’ in itself for the consumer. Instead, he suggests that intentions and goals are

continuously negotiated as users look to overcome obstacles, resist temptations and maintain willpower to achieve evolving goals ([Bagozzi et al, 2007](#)). This conception of human action is closely aligned with that of Phenomenologist Alfred Schütz' 'project structures' ([Schütz, 1967](#)).

Hsu ([2008](#)) concentrated on 'continuance' (the continued use of a technology), rejecting the widespread assumption that adoption and continuance are homologous ([Hsu, 2006](#); [Hand and Rettie, 2008](#)). Hsu et al introduced 'disconfirmation' - or failed prophecy - as an extension to the Theory of Planned Behaviour (TPB) model (itself an offshoot of the popular TAM. The questioning of context is highly pertinent to this thesis since it looks to reflect on the 'lived experience' of grocery shopping in the new online context. This thesis looks to avoid weaknesses in the TAM and TPB approaches such as the simplification of human agency and the assumption that experimental studies infer real-life behaviours. This is achieved by using real-world data and by engaging holistically with consumer practices from the perspective of the individual.

Consciousness in consumer behaviour

The role of the unconscious mind in consumer behaviour has often caught the imagination of the retailer (accounting for that fresh bread smell pumped out in supermarkets) and has yielded much academic repartee in the field of consumer psychology.

Dijksterhuis et al ([2005](#)) assert that consumer behaviour is strongly influenced by environmental cues (absorbed by the unconscious mind). They characterise this phenomenon as pertaining to the 'perception-behaviour link' in which consumers align

their behaviour with that of the local social environment. This is contested by Simonson (2005), who suggests that whilst an individual might not be able to recall what prompted them to think of a certain product, cognitive functions do play a role in deciding which and whether to purchase the item, i.e. that there is an interplay of the unconscious and conscious in decision-making processes. Similarly, Janiszewski and Osselaer (2005) argue that there is volition in the selection of method to achieve even the simplest of unconscious activities. Dijksterhuis et al (2005) riposte that this would render a person terribly inefficient, instead asserting that there is a default mechanism that has to be actively or indeed consciously problematised by moderating factors to deviate from the default behaviour. This stance is more aligned with an ‘interpretive actor’ perspective and yet the authors also refer to a lack of consciousness of environmental cues as somehow expressing a level of incompetence:

Such meta-awareness is important because if consumers are unaware of such changes in their behaviour – either because such changes are subtle or because consumers do not closely monitor their actions – they are unlikely to counter the influence of these cues. (Dijksterhuis et al, 2005, p. 226)

Whilst it is readily promoted that consumer psychologists have rejected the economic rational actor model in favour of a more complex and realistic ‘psychosocial-cultural-economic rationality model’ (Firat et al, 1995), the approach still strongly resembles the neo-liberalist view of human action – that lacking knowledge and control over one’s actions pertains to a deficient individual (McDowell, 2005).

Theory of practices in consumption

Grocery consumption is embedded in a complex, context-specific set of social practices that individualist approach doesn’t capture - processes of change and continuity better captured - conflicts between practices and identities

When employing practice theory, methodologies tend to be tailored to the context.

Shove's three elements of practices: 'materials', 'meanings' and 'competencies' provided Meier et al with a framework for their study of alcohol consumption practices ([Meier et al, 2018](#); [Shove, 2016](#)).

They built on Shove's three elements by adding a fourth dimension 'temporalities' to encompass the importance of time in the context of drinking habits. In this thesis, we conceptualise the last dimension as 'geo-temporalities' to include the geographies of consumption facilitated by mobile technologies.

[Table 3.1](#) shows how Meier et al defined examples of each dimension in the study of alcohol consumption and how this might translate to online grocery shopping.

Table 3.1: Four dimensions of practice

Dimension	Example in Meier et al (2017)	Example in grocery shopping
Materials (equipment/resources/objects)	e.g. alcoholic beverages, bars, glassware, televisions, dance-floors.	devices, website, food cupboards in the home
Symbolic meanings / shared understandings	e.g. sophistication, relaxation, transgression, belonging, fellowship	providing, thrift, treating, time-saving, nutrition, quality, fresh, up-market
Competencies (procedures/skills)	e.g. keeping intoxication levels appropriate to the situation, awareness of culture-specific drinking rituals such as round buying, toasting, knowing how to open a champagne bottle.	skill in selecting products and deals, ability to manage home and work identities, multi-tasking, skill to select nutritious meals, ability to manage household, ability to manage relationships, skill exhibited in time saving etc

Temporalities	drinking times/days, duration of a drinking occasion, temporal positioning of drinking relative to other practices such as work, eating, celebrating, socializing, relaxing	variation throughout day and week to interface with other practices, editing basket, shopping in different locations, multi-tasking, using as list to add to over a number of days, shopping for an occasion/at a time of year, shopping for business vs. home purposes, shopping for others
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These dimensions form the basis for structuring and interpreting qualitative findings in this thesis (see Chapter 5). But as Meier et al articulate:

Although the majority of research in this mode has used qualitative methods, Shove's schema of interwoven and mutually dependent practice elements facilitates quantitative measurement by suggesting that important insight can be gained through observation of clustering and covariations over time of the different types of elements that make up practices ([Meier et al, 2018](#)).

3.2.3 Summary of consumers and consumption literature

This section has summarised literature in the field of online consumption and has identified gaps in the literature.

With notable exceptions ([Briesch et al, 2009](#); [Wang et al, 2015](#); [Dawes, 2013](#)) most online grocery shopping research to date has been qualitative in nature or based on self-reporting of behaviour and preferences in small-scale studies. This has created a body of literature whose findings are wholly dependent on the efficacy of the 'intention-behaviour link', itself widely criticised ([Bagozzi et al, 2007](#)). There is a paucity of empirical real-world quantitative analysis of online grocery shopping; and little empirical evidence of consumer demographics or users' response to the new online context in terms of price-sensitivity, total spend and product selection. This thesis redresses this balance by considering the real-world behaviours of hundreds of thousands of online

grocery consumers and looks specifically to identify whether there are changes in consumption activities in the new online context.

[Table 3.2](#) summarises the insights regarding consumer characteristics and practices as they have been conceptualised and observed in consumer psychology, retail geography and anthropology to date. [Table 3.3](#) in Section 3.3 highlights some of the key gaps in this literature and how this thesis addresses these in the fourth and final research question of this thesis.

Table 3.2: Summary of literature relating to online consumer characteristics and practices – relevant to RQ4

	Dimension	Finding(s)	Example(s)
Demographics and characteristics	<i>Gender and household</i>	<ul style="list-style-type: none"> Companionate marriage and non-traditional households contributing to more males doing the grocery shopping Ability to shop ‘anywhere’ could be contributing to a shift in gender roles Proportion of females among online grocery shoppers ranges from around a third to around three quarters among different studies Families with children are the most likely to shop for groceries online; the poorest and elderly are least likely 	Bowlby et al (1997); McDowell (2007); Kelloggs (2015); Sieber (2000); Hansen (2008); Harris (2017); Rohm and Swaminathan (2004)
	<i>Age</i>	<ul style="list-style-type: none"> Generation X (those aged around 35-54) are the most likely to shop online Conflicting findings relating to Millennials and younger users Some evidence that the demographic of online shoppers has increased over time (that Millennials were the ‘early adopters’) 	Hwong (2018); Li (1999); Sieber (2000); Redman (2018); Lian and Yen (2014)
	<i>Location</i>	<ul style="list-style-type: none"> Distance from supermarket affects propensity to shop online Mobile technologies facilitate personalised, ‘micro-geographies of consumption’ Consumers enjoy shopping in relaxed home environment Consumers like that they can multi-task with home-based online shopping Consumers rarely have a set time or place to shop with online shopping 	Crewe and Lowe (1995); Ritzer (2011); Michaud Trevinal (2014); Robinson (2007); McDowell (2007); Gregson and Lowe (2004); Roberts (2017)

Practices and preferences	<i>Price-sensitivity</i>	<ul style="list-style-type: none"> • Consumers spend more online: <ul style="list-style-type: none"> • M-shoppers increase in value over time • M-shoppers spend more than they used to in-store • Individualistic spending - increased propensity to treat • Purchases not on shopping list – justified as taking advantage of offers • Consumers spend less online: <ul style="list-style-type: none"> • Online and household shopping more disciplined and thrifty • Shop less regularly, spend less online 	Wang et al (2015); Degeratu et al (2000); Miller (1998); Robinson (2007); McDowell (2005); Chu et al (2008); Kushwaha and Shankar (2013); Harvey Brown and Goodman (2001); Morgan (1998); Rogoff (1984); Briesch et al (2009); Simmons (2008); Roberts (2017)
	<i>Time-poverty</i>	<p>Evidence to support increased time poverty:</p> <ul style="list-style-type: none"> • Twenty-first century families are 'time-poor' • Consumers do whole shop in minutes, using 'favourites' • Consumers who prefer to shop online are driven by convenience, with low requirement for variety, and lower demand for receiving products instantly <p>Evidence contesting increased time poverty:</p> <ul style="list-style-type: none"> • Propensity to multi-task extends online shopping time • Online shoppers spend a matter of seconds selecting products online, although this was similar to offline • No evidence to support time being a factor of convenience online 	Wajcman (2014); Robinson (2007); Michaud Trevinal (2014); Rohm and Swaminathan (2004); Anesbury et al (2015); Cobb and Hoyer (1985); Dickson and Sawyer (1990)

<i>Trust and basket composition</i>	<ul style="list-style-type: none"> • Consumers are worried about purchasing perishable products online • Consumers are worried about receiving inappropriate substitutions when shopping online • More brands, but lower SKUs = higher spend • Brand loyalty (including own-brand) is higher online 	Hand et al (2009)
<i>Devices</i>	<ul style="list-style-type: none"> • desktop/laptop > in-store > mobile • m-shoppers tend to opt for known/branded goods because of screen size / low 'media richness' • m-shoppers increase in value over time • m-shoppers spend more than they used to in-store • multi-channel shoppers (in some product categories) spend more than single channel shoppers • search bar preferred method of site navigation 	Maity (2014); Wang et al (2015); Ansari et al (2008); Kushwara and Shankar (2013); Anesbury et al (2015)
<i>Adoption, loyalty and accessibility</i>	<ul style="list-style-type: none"> • offline interaction with brand and online word-of-mouth recommendations most likely to attract consumers to online offering • double jeopardy effect in force in online - those with lower market share suffer from lower brand loyalty • Loyalty to a single retailer is lower online • moving to online shopping requires significant shift in behaviour, so is a slow process • shopping online does not usually entail discontinuation of shopping offline • Adoption does not imply continuance 	Rafiq (2005); Danaher et al (2003); Dawes and Nenycz-Thiel (2013); Hansen et al (2011); Hand et al (2009); Hsu (2008); Warchauer (2004); Vass and Davis (1996)

- Online shopping perpetuates a 'digital divide', eroding the skills off offline shopping for some
- More brands, but lower SKUs = higher spend
- Brand loyalty (including own-brand) is higher online

*Consciousness,
behaviour and
practices of
consumption*

- Having to develop new skills to shop online shifts shopping into 'discursive consciousness' Shopping is (at least temporarily) no longer an automatic event.
- Whether conscious of it, consumers are always engaging in cognitive behaviours when shopping
- Consumers do not engage in cognitive behaviours most of the time, but respond to environmental cues and draw upon learnt skills

Simonson (2005); Janiszewski (2005); Dijkterhuis (2005); Schütz ([1967](#))

3.3 Summary of gaps in the consumer and consumption literature and derivation of RQ4

This chapter has shown that there is a lack of work relating to consumer practices in the online grocery market. It has outlined what is known about consumer behaviour from the fields of retail geography; anthropology; consumer psychology; marketing; e-commerce and human computer interaction (Table 3.2); and social theory and has identified key gaps in the literature. Table 3.3 summarises the key gaps pertinent to online grocery consumption and shows how this thesis addresses these shortfalls. The fourth research question was devised to address these gaps in the consumer and consumption literature by asking:

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

Table 3.3 also illustrates how the fourth research question addresses the gaps identified in the literature.

Table 3.3: Gaps in the consumption in online grocery shopping literature

Gap(s) identified	This thesis...
Digital transformation of consumer practices	How RQ4 addresses the gap(s)
Not aware of any large-scale studies of UK online grocery shopping	Makes use of a huge volume of real-life transaction data alongside interviews with key retail executives, analysts and customers. (RQ4)
Conflicts between authors / sectors have emerged particularly with regard to how demographics relate to consumption practices online. Conflicts identified included: <ul style="list-style-type: none"> Gender – inconsistency in findings relating to whether men are more likely to shop online. Age – some studies find young people spend more online, others find them a 	Utilises access to a huge volume of real-life transaction data along with national level statistics to assess the demographic characteristics of the UK's online grocery shoppers. Also uses focus-group responses to triangulate findings in terms of consumer perceptions and actual consumer behaviour.

minor contributor; similar conflict between spending habits of older people and propensity to engage with technology.

- Role of geography – both the erosion of distance and the convenience/inconvenience of online shopping not well established.
- Social group – not mentioned in most studies.

Consumer preferences and new online behaviours have been proposed, but there is little empirical evidence to date.

Looks to avoid weaknesses in the TAM and TPB approaches such as the simplification of human agency and the assumption that experimental studies infer real-life behaviours. This is achieved by using real-world data and by engaging holistically with consumer practices from the perspective of the individual. Particular areas of investigation include addressing the conflicts in findings with respect to channel preference; time-poverty; price-sensitivity and whether shoppers avoid perishable good when shopping online.

This chapter has given a critical overview of the academic literature pertinent to online grocery shopping and has shown how this body of work has guided the development of the research questions central to this thesis. The next section outlines and justifies the mixed-methods web science approach employed in this thesis to address the research questions posed in this chapter.

4. Methodology

4.1 The web science approach

This is a web science thesis, concerned with understanding the burgeoning socio-technical system that is the world wide web. Web scientists do not simply apply traditional techniques to the domain of the web, but rather they seek to develop new frameworks and techniques to understand how (or indeed whether) the web changes the way we experience and conduct our lives ([Berners-Lee et al, 2006](#); [Appendix B](#)). As articulated by the Web Science Institute in Southampton,

“Web Science has an ambitious agenda: to focus the analytical power of researchers from disciplines as diverse as mathematics, sociology, economics, psychology, law and computer science to understand and explain the Web. It is necessarily interdisciplinary - as much about social and organizational behaviour as about the underpinning technology.” ([Web Science Institute, no date](#))

As well as being interdisciplinary by nature, web science studies generally demand mixed-methods approaches to unravel the interplay of web technologies and human agents. Mixed-methods approaches have been proposed as a superior method to mono-method quantitative or qualitative methods for a variety of reasons. Researchers have justified their use of mixed-methods to improve the accuracy of their data; as a way of lessening the effect of bias in single-method approaches; and to verify results by approaching questions from two angles (a form of triangulation) ([Denscombe, 2008](#)). On the surface, the prospect of applying a mixed-methods approach seems entirely achievable – one ‘cherry picks’ the best of the quantitative and qualitative insights and combines them to produce results richer than either approach alone ([Bergman, 2008](#)).

However, the task of meaningfully combining approaches that have historically been considered to be fundamentally at odds with one another is non-trivial. The assertion that quantitative research is ontologically 'positivist', whilst qualitative research is traditionally 'constructivist' plagued scholars through much of the twentieth century, leading to the 'incompatibility thesis' – the assertion that it is ontologically impossible to combine qualitative and quantitative research methods ([Howe, 1988](#)).

The positivist conception of reality - that there is a single, observable reality that can be consistently measured is pitted against the interpretivist/constructionist paradigm, which advocates a conception of reality that is constantly changing, is constructed by social agents and the interpretation of which is contingent on the approach and biases of the individual researcher ([Onwuegbuzie and Leech, 2005](#)). Similarly, whilst positivism dictates that the researcher should be objective and separate themselves from the object of study, interpretivists see the researcher and researched as interdependent such that maintaining an objective stance is not only impossible, but likely to yield less rich research outcomes ([Onwuegbuzie and Leech, 2005](#)).

Despite this history of antagonism between paradigms, some have questioned the concrete distinction between qualitative and quantitative methods that has provoked this tension. Sechrest and Sidani ([1995](#)) state their opinion that from a fundamental epistemological stance, they are indistinguishable. Both use empirical observation to describe events and to "speculate about why the outcomes they observed happened as they did" ([Sechrest and Sidani, 1995](#), p. 78). Furthermore, as Allwood ([2011](#)) points out, a single data collection method can often be used to collect both qualitative and quantitative methods (such as questionnaires. Labelling qualitative and quantitative

research methods as incompatible seems redundant when data are so frequently co-collected and where quantification is often a method of understanding or interpreting a wider qualitative phenomenon. In fact, it can be argued that quantitative data are effectively meaningless without a qualitative context and the qualitative nature of human interpretation ([Sandelowski, 2009](#)).

Onwuegbuzie and Leech ([2005](#)) also emphasise the parallels in the ways quantitative and qualitative researchers interpret data. Whilst they acknowledge that the techniques employed are distinct (quantitative researchers use statistics to make generalisations whilst qualitative researchers often employ phenomenological techniques), they assert that both paradigms use analytical techniques to extract meaning, both try to control and account for bias and both use techniques to validate data ([Krefting, 1991](#)).

Some still staunchly defend the ‘incompatibility thesis’, believing that it is impossible to concurrently maintain a positivist and interpretivist/constructivist stance. Sale et al ([2002](#)) thus propose that mixed-methods is only possible if the researcher argues that one or other perspective is applied to both quantitative and qualitative research, i.e. that qualitative research is in fact constructed in a positivist fashion. To some extent this represents the thesis of the ‘critical realists’ for whom there is an underlying structuring reality, although it may only be observable in a probabilistic or interpreted manner. Critical realism has in fact been proposed as an alternative to post-positivism in the wake of sustained criticism of positivist approaches ([Patomaki and Wight, 2000](#)). Despite this ongoing theoretical debate, most of the academe has sought to resolve the apparent paradox, seeing the demonstrable benefits of employing mixed-methods as more important than being confined by a potentially irresolvable ontological debate. Howe ([1988](#)) suggested that rather than trying to reconcile opposing paradigms, it was possible to apply a pluralist approach, with the use of a ‘pragmatic’ research paradigm.

The role of this (web science) thesis is not to engage in the broader philosophical debate around the nature of truth, but rather to employ them pragmatically to address different phenomena within the area of investigation - an approach generally acceptable to even the ardent critics of mixed-methods ([Sale et al, 2002](#)). As such, this thesis adopts an interdisciplinary, pragmatic mixed-methods approach – seeking to understand the interplay of human agents and web technologies in the ever-expanding socio-technical system that is the world wide web.

When considering the digital transformation of the UK's grocery market, this approach allows us to consider retail executives and employees as agents, drawing upon resources around them to make sense of the strategic and organisational implications of engaging with the online grocery market.

From a consumer perspective, the experience of online grocery shopping is considered from the perspective of the interaction of the human agent and the web technology, where we consider human agency as the "active, wilful character of human actors" ([Snow, 2003](#), p. 812). Online shopping facilitates an approach where retailers and analysts no longer need a 'proxy' for a consumer, but are able to track each individual consumer by the trail of data they leave behind them. Gaining insight into the motivations, thought processes, identity creation and practices of these individuals becomes ever more poignant to predicting and responding to their consumption behaviours ([Weidman and Dunn, 2015](#)).

The remainder of this chapter outlines the development of the methodological approach adopted in this thesis; and the rationale for the specific methods used. Recall the overall aim of this thesis,

How are traditional retailers and their consumers responding to the digital transformation of the UK's grocery shopping market?

and the four research questions:

RQ1: What are the drivers (and barriers) to entry in the UK's online grocery market?

RQ2: What strategic shifts occur when traditional supermarket retailers undergo digital transformation?

RQ3: What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

The starting point for selecting a research plan to address this central aim was to consider the nature of the research problem ([Noor, 2008](#)). This was achieved by considering each of the four core research questions (RQ1-RQ4) in turn and asking:

- What sort of data is needed to answer this question?
- Which specific research methods are most appropriate and why?

This chapter is organised as follows:

- **Section 4.2: Data collection requirements** outlines the outcomes of this interrogation process for each of the research questions.
- **Section 4.3: Research design** justifies the approach to data collection, analysis and integration of findings adopted in this thesis.

- **Section 4.4: Operationalisation of methods** outlines the practical steps taken to collect, process and analyse data; and addresses the constraints and difficulties encountered.

4.2 Data collection requirements

4.2.1 Digital transformation of the UK's grocery market (RQ1-RQ3)

What sort of data are needed to answer these questions?

Some of the drivers, strategic shifts and outcomes of Morrisons' entry to the UK's online grocery market could be explained by interrogating quantitative data sources such as Morrisons' financial statements and financial trends in the broader market. This would not however explain why Morrisons chose to enter the market whilst other retailers such as Aldi, Lidl and Coop have refrained from doing so. It would not explain how Morrisons' employee culture has evolved, what strategic changes have been made, or how well-equipped Morrisons are to succeed in the online grocery market. For these reasons it was decided that addressing the drivers and strategic shifts of Morrisons' digital transformation (RQ1, RQ2) would require collecting qualitative data. To assess whether Morrisons' strategic move into online grocery shopping has occurred as intended (RQ3), a mixed-methods approach was deemed appropriate. Qualitative methods were used to assess how Morrisons' executives, competitors and retail analysts felt about the entry to market; whilst quantitative analysis of company reports would

provide further evidence of the success (or failure) of Morrisons' digital transformation and entry to the UK's online grocery market.

Which specific research methods are most appropriate and why?

Semi-structured Interviews

Interviews were selected as the primary qualitative research method to address the drivers, strategic shifts and outcomes of Morrisons' digital transformation and entry to the UK's online grocery market (RQ1, RQ2 and RQ3). Insights from interviews were also used to give an industry perspective of consumer change (RQ4).

Interviewing was considered particularly relevant to examine the subjective experiences and practices of individuals rather than looking only for generalisable trends ([Vogt, 2012](#)). The rich responses sought in order to learn as much as possible about Morrisons' experiences of entering the online grocery market prompted the rejection of surveys as a data collection method since in-depth questions and answers are difficult to translate into the survey format. Real time, synchronous interviews allowed for the clarification of responses, avoiding the pitfall of incomplete or incomprehensible responses to survey questions ([Kelley et al, 2003](#)). Interviews also allowed ideas and themes to emerge organically ([Charmaz, 2014](#)). This explorative data collection method was considered valuable in the nascent field of digital transformation in the online grocery market since there is little empirical evidence of strategies to date. It was decided that semi-structured interviews would be most appropriate since they provided sufficient structure to facilitate the execution of the interviews and to allow comparison between interviews ([Longhurst, 2003](#)), whilst not stifling respondents' ability to express the richness of their opinions and experiences ([Geertz, 1974](#)).

Drawbacks of conducting the interviews included the time needed to transcribe interviews ([Bryman, 2012](#)) and the need for the interviewer to have strong communication skills ([Clough and Nutbrown, 2007](#)). It was decided that the desire to elicit individuals' practices and to gain in depth understanding of their decision making processes warranted individual interviews over a focus group or a less flexible survey method.

The practical implementation of the semi-structured interviews and how the outcomes were used to extend Matt et al's 'four dimensions of digital transformation' are outlined in Section 4.4.1. Focus groups with Morrisons' customers and other online customers were also used in addressing RQ1-RQ3 to gain a customer perspective on Morrisons entry to the UK's online grocery market.

The operationalisation of the quantitative analysis of company reports to contribute evidence to RQ3 is detailed in Section 4.4.2.

4.2.2 Digital transformation of consumer practices (RQ4)

What sort of data are needed to answer this question?

Assessing whether the digital transformation of the UK's grocery market has reconfigured consumer strategies demanded an interdisciplinary, mixed-methods approach. Consumer practices and strategies can be seen in the outcomes of consumption but cannot be readily explained without understanding the consumer's motivations, habits, skills, resources and constraints.

Which specific research methods are most appropriate and why?

Focus groups

The conversational format of focus groups facilitates discussion of a range of topics and themes are more likely to emerge than from a one-to-one interview ([Zikmund, 2009](#)).

The group dynamic also gives time for participants to collect their thoughts, such that there is less pressure on the individual to provide an immediate (but perhaps less candid/authentic) answer to a given question (*ibid*).

One of the major advantages of focus groups is that participants will tend to guide the conversation from the initial impetus towards exploring “the issues of importance to them, in their own vocabulary, generating their own questions and pursuing their own priorities” ([Kitzinger, 1995](#), p. 299). This can uncover themes and ideas that may not have occurred to the researcher and which the formality of the one-on-one interview format can obscure ([Liamputtong, 2011](#)).

Where the focus group’s suitability for measuring online grocery shopping practices is most called in to question is its tendency to induce group-think, or group-mindlessness, where respondents are influenced by other members of the group ([MacDougall, 1997](#)).

As we saw previously, the Intention-Behaviour assumption is widespread, but not without its critics. It has been reported that whilst more subservient participants may agree with the dominant view within the focus group, they hold a different view when asked individually ([Bloor et al, 2001](#)). This poses a risk to the efficacy of focus groups in the context of online grocery shopping, which is often a solitary pursuit, or done within a family setting, rather than with peers. In a similar vein, focus groups have been criticised for their tendency to be monopolised by dominant personalities ([Sim, 1998](#)).

Whilst this is widely seen as a shortcoming of focus groups, under argued is the possibility that dominant voices pervade naturalistic settings too and do not require

mediation. It may for instance be better to interrogate the views and actions of underrepresented voices in other contexts.

Several authors have cited speed as a reason to adopt focus groups over in-depth interviews ([Zikmund, 2009](#); [Hennessy and Heary, 2005](#)). Flick ([2011](#)) warns that the importance of group dynamics make comparisons between groups valuable, but comparisons of individuals across different groups less meaningful. As such, Flick claims that an interview is roughly equivalent to a focus group such that there is no time-saving advantage in performing focus groups ([Stokes and Bergin, 2006](#)). Landgraf ([1957](#)) is less committal, citing a lack of evidence to prioritise in-depth interviews over focus groups for the analysis of individual thoughts and views.

Despite the articulated shortcomings, it was decided observation of a number of case studies would form a useful step in this research. The focus groups served as an exploratory phase in order to establish the themes and language emerging from interaction with online grocery shopping ([Barbour, 2008](#); [Gill et al, 2008](#)). By eliciting the experiences of real-world shoppers, the findings of the focus group observations were used to develop quantitative hypotheses. These hypotheses sought to uncover changes in consumer practices in the online era.

Consumer analytics

The quantitative phase used real-world online transactions from Morrisons.com Google Analytics account to test the proposed hypotheses. The operationalisation of the focus group analysis and the subsequent quantitative phase is outlined in Section 4.4.

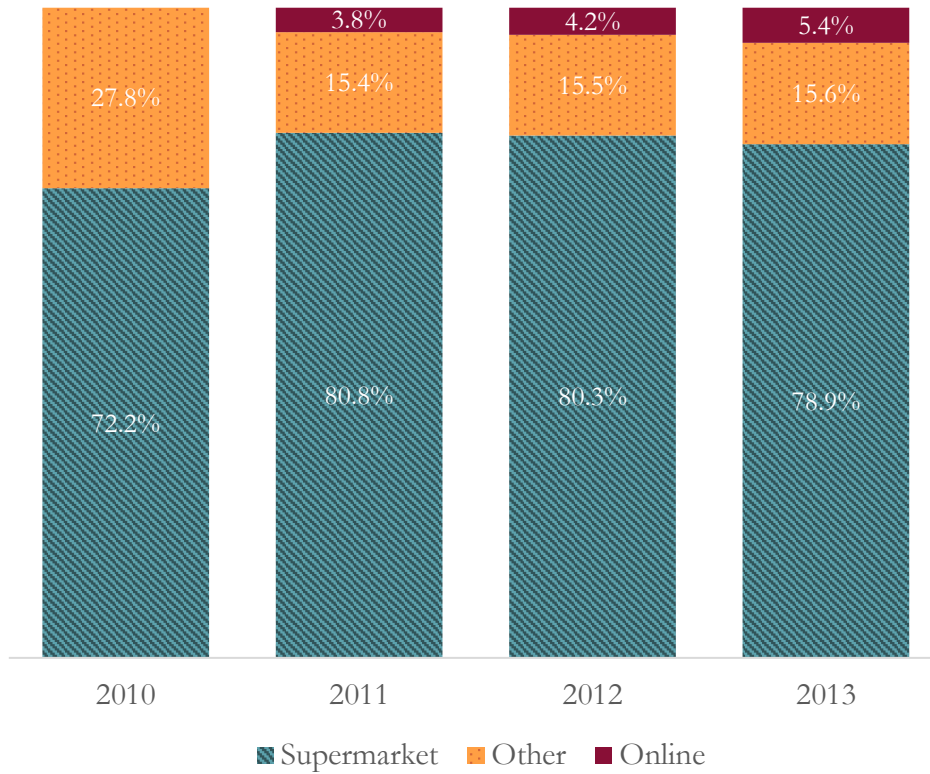
4.3 Research design

Having established the data requirements for each of the four research questions, the plan for executing the research was formulated.

- **Section 4.3.1: Rationale for a case study driven approach** justifies the decision to select Morrisons as a case study firm undergoing digital transformation in the UK's grocery market.
- **Section 4.3.2: Research design options** evaluates a number of mixed-methods approaches and justifies the selected research design. See [Appendix D](#) for more on qualitative, quantitative and mixed methods.
- **Section 4.3.3: Final research design** outlines the final research design.

4.3.1 Rationale for a case study driven approach

Case studies have been cited as particularly relevant when the focus is on a contemporary phenomenon within a real-life context ([Yin, 2007](#)). This is due to the ability to gain holistic and rich insight - allowing the researcher access to emergent properties in fast moving organisational contexts ([Noor, 2008](#)). As such, it is an appropriate approach for studying online grocery shopping, which has emerged since the advent and mass proliferation of the web in the 1990s and 2000s ([World Wide Web Foundation, 2012](#)). Evidence of the plight of incumbent retailers undergoing 'digital transformation' to join an online grocery market is particularly sparse.

Figure 4.1: UK household average expenditure on food by channel

Source: ONS Family Spending survey of 5,020 households ([Davies, 2017](#))

Online grocery shopping has only become a significant part of everyday life in the UK over the past few years, with the proportion of the grocery shopping market attributed to online sales in the UK growing from around 0% to approximately 5% between 2010 and 2013 ([Figure 4.1](#)). This has remained largely unchanged between 2013 and 2016 but is projected to rise to 9% by 2020 ([IGD, 2016](#); [Orrow, 2016](#)). It has been estimated that nearly three-quarters of UK households now use the web to buy or research groceries ([Chapman, 2012](#)) and around a fifth of UK adults do most (or all) of their grocery shopping online ([Intel, 2014](#)).

Case-study research has traditionally been considered a useful tool for exploratory and descriptive studies but has been criticised for its limited potential to generalise findings Flyvbjerg (2004). However, Flyvbjerg (2004) and Feagin et al (1991) argue that case studies entail the flexibility to encompass all phases of research – namely exploratory, descriptive and explanatory studies facilitating theoretical generation and generalisation. Taber (2000) suggests this is made possible by broadening the definition of generalisation beyond the positivistic conception of statistical generalisation and considers analytical generalisation – i.e., the “extent to which findings from one study can be used as a guide to what might occur in another situation” (Kvale, 1996, p. 233). This rationale is combined with statistical generalisation in this thesis. Morrisons’ consumer experience is harmonised with national level findings to give deeper insight into online grocery shopping habits across the UK (see Section 5.6.2).

Case-study research can involve qualitative and quantitative data collection (Yin, 2007) and is therefore suitable for the mixed-methods approach demanded by this thesis. Jick (1979) describes how qualitative insights are useful for providing a rationale for puzzling relationships exposed by quantitative data, or in formulating theory that can be verified using quantitative approaches.

Single case study

Nock et al (2007) describe how the methodological flexibility facilitated in single case study research provides an opportunity to closely observe behaviour as it occurs in its natural setting. These insights can then lead to the proposition of hypotheses that can be tested empirically. Feagin et al (1991) acknowledge the limitation of observing covariance when a single case study is employed. This thesis acknowledges this and expands on Matt et al’s four dimensions of digital transformation to articulate the ways

in which Morrisons' transformation has been unique; and the ways it shares features of other digital transformations.

When looking at consumer practices, this thesis positions consumers as individuals who engage with the primary retailer, but whose interactions with a broad range of stakeholders – other retailers, family members and friends – result in a rich dynamic of variables affecting consumption behaviour. From a more practical point of view, gaining simultaneous access to consumer data from multiple UK retailers would be challenging – such is the economic value attributed to consumer data in establishing competitive advantage in what remains a low margin sector. The likelihood of accessing the quantity and quality of consumer data from across the sector would thus be prohibitive. It is also argued that this thesis is not looking to compare well known variables across online retailers, but rather to identify what the variables of online consumer practices are.

Case-study selection – WM Morrisons Plc (Morrisons)

Unlike statistical sampling, the selection of a single case in case study research is not usually randomised ([Glaser and Strauss, 1967](#)), but is chosen because it displays characteristics that are theoretically useful, e.g. those that replicate or extend a given theory, or those that lie at the extreme of a given phenomenon ([Eisenhardt, 1989](#)). As a 'late to market' e-tailer, with a significant presence as the UK's fourth largest grocery retailer, Morrisons forms a particularly significant case study, as it exposes a set of characteristics that will be increasingly relevant in the ongoing digital era.

The target demographic of Morrisons has traditionally comprised lower income shoppers and families – groups that are not only offering a threat to traditional retail by

their movement towards the online channel, but also the target of a resurgent offline channel – the ‘discounters’. Discounters such as Aldi and Lidl possess an intriguing status as market entrants with lower overheads in the UK on the one hand; and the only part of the sector expanding its physical (store-based) presence ([Armstrong, 2015](#)).

Morrisons established itself as a key player in the pre-digital era. Online is a channel populated not only with its traditional competitors, but with a new wave of ‘pureplay’ market entrants such as Ocado, Amazon Fresh, Hello Fresh, Abel & Cole and Riverford Foods. Morrisons’ entry to market has taken a novel trajectory, entering into a ‘coopetative’ relationship with Ocado. The agreement with Ocado is described in [Appendix C](#). In addition to the deal with Ocado, Morrisons made an agreement with Amazon to sell its products on Amazon Fresh ([Ruddick, 2016](#)). This represents another pioneering relationship within the online grocery market and reflects a perceived expectation of ‘one click’, next day delivery shopping demanded by consumers who have become accustomed to the efficiency of non-food goods purchases ([Hobbs, 2016](#)).

Morrisons thus represents a unique set of characteristics lending itself as a highly relevant case study in studying nascent online grocery shopping practices. It is an incumbent grocer, late to join the online grocery market; and yet has recently engaged in pioneering relationships with Ocado and Amazon that could reshape the industry, consumption practices and the retailer-consumer relationship.

4.3.2 Research design options

Section 4.1 presented the rationale for selecting a mixed-methods approach for this thesis. This section considers the formulation of the specific mixed-methods research design to address the research questions.

There are no hard and fast rules for designing a mixed-methods study, owing to the great number of permutations of methods available to the mixed-methods researcher. Guidelines built upon audits of mixed-method use in research have been conceptualised by several authors over the years, notably Morse ([1991](#)) - who devised a notation now widely applied in mixed-methods; and Creswell et al, who has written widely on mixed-methods research ([Creswell et al, 2002](#); [Creswell et al, 2003](#); [Creswell et al, 2007](#); [Creswell et al, 2009](#)). There are many features common to these guidelines for implementing a cogent research design. These include:

- Deciding the balance of qualitative and quantitative methods
- Considering when and how to apply each method
- Considering the point at which methods are integrated or synthesised

The following sections work through these considerations with respect to the research aims of this thesis. These considerations form the basis of the selected research design, which is summarised in [Figure 4.3](#).

The balance of qualitative and quantitative methods

Mixed-methods research can give equal weighting to the qualitative and quantitative components. However, there is often a driving method that provides the major emphasis for the study and the other method is used to complement the approach. Morse ([1991](#)) proposed a notation that has been widely adopted and reused since where the major component of a study is capitalised and the minor is in lowercase. [Table 4.1](#) summarises the most common approaches to collecting qualitative and quantitative methods and outlines the role of the minor component in each case.

This thesis is primarily exploratory, seeking to understand and theorise a nascent process – namely the digital transformation of the UK’s grocery market. It is informed by the qualitative component which primarily proceeds the quantitative component (used to test and explore hypotheses emerging from the qualitative phase). The research can thus be considered sequential ([Morgan, 1998](#)). Creswell et al ([2003](#)) refer to this as ‘sequential exploratory’, roughly equivalent to Morse’s QUAL → quan conceptualisation ([Morse, 1991](#)).

Table 4.1: Balance and order of data collection options for a mixed-methods study

	Mode of Data Collection	Role of Minor Component
Concurrent	QUAN + qual	Explore non-quantifiable phenomena
	QUAL + quan	Enrich description of QUAL component
Sequential	QUAN → qual	Explore unexpected results in QUAN component
	qual → QUAN	Inform design of QUAN component
	QUAL → quan	Test theories/hypotheses emerging from QUAL component
	quan → QUAL	Inform design of QUAL component

Adapted from Morse ([1991](#)); Creswell et al ([2003](#))

One drawback of adopting a sequential design include the extended time period required, since the second phase is not usually started until the first phase has been completed ([Driscoll et al, 2007](#)). Sequential designs are however easy to implement and document ([Creswell et al, 2003](#)) and the clear points of integration reduce the risks of clumsy integration of the qualitative and quantitative components ([McMillan, 2006](#)).

When and how to combine qualitative and quantitative findings

The issue of when to combine the qualitative and quantitative components of a study should be determined in order to ensure that qualitative and quantitative data are collected in a way that best prepares them for meaningful integration ([Fetters et al, 2013](#)).

Sequential exploratory designs are usually associated with a synthesis of qualitative and quantitative methods at the 'interpretation' phase ([Edmonds and Kennedy, 2013](#); [Creswell et al, 2003](#)), once the data collection and analysis has been performed for each method, as outlined in [Figure 4.2](#). It is worth noting however that this mixed-methods approach involves integration throughout the whole study. The sequential exploratory approach predicates integration at the design stage; integration during the study includes transformation of the data from qualitative insights to quantitative hypotheses; and integration at the final interpretation stage involves weaving qualitative and quantitative insights together to address the research questions ([Fetters et al, 2013](#)). The process of integrating qualitative and quantitative phases of this research occur at several stages throughout this thesis. The main points of integration are briefly outlined in [Table 4.2](#).

Figure 4.2: Sequential exploratory research design process

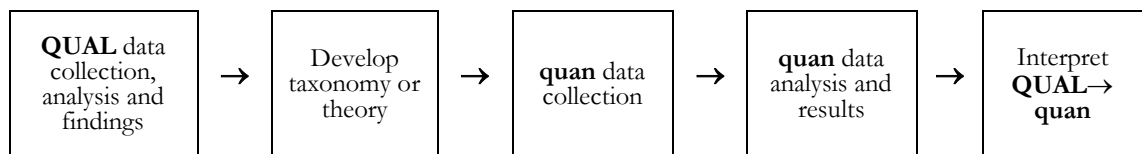


Diagram as in Edmonds and Kennedy ([2013](#))

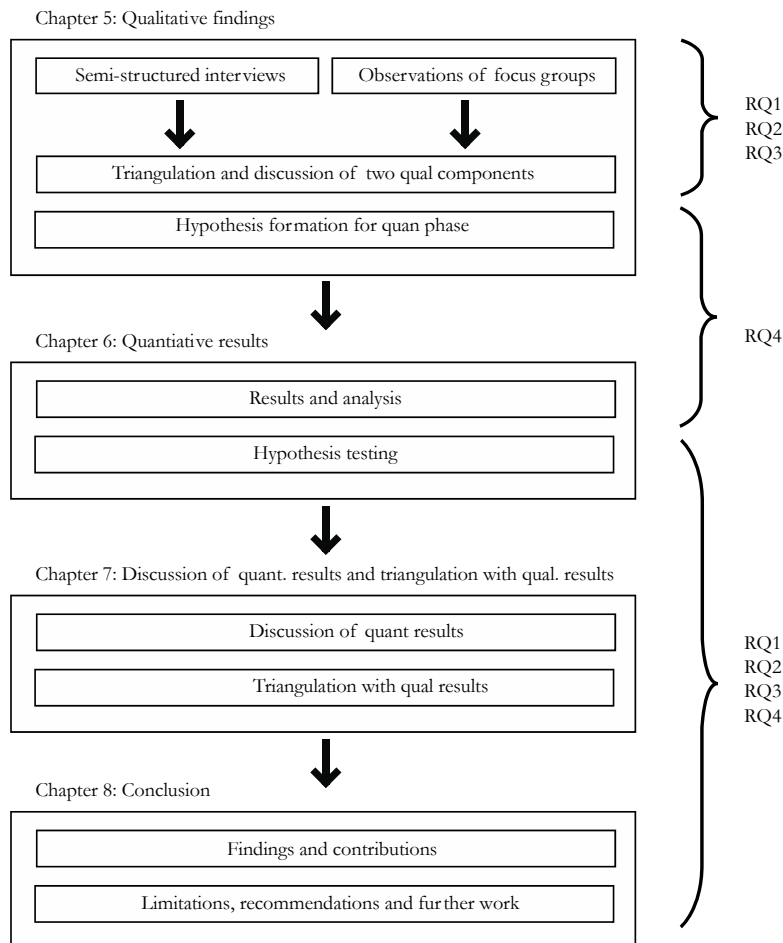
Table 4.2: Integration of qualitative and quantitative methods throughout this thesis

Integration phase	Description of integration
Theory Building	<ul style="list-style-type: none"> Qualitative insights derived from interviews and focus groups are used in the development of hypotheses for the quantitative phase. The quantitative phase is used to evaluate the outcomes of digital transformation and to observe online consumer practices in action.
Interpretation	<ul style="list-style-type: none"> Interpretation of the results of the quantitative phase using insights drawn from qualitative phase. Development of a model of digital transformation - expanding on Matt et al's four dimensions of digital transformation.

4.3.3 Research design summary

This chapter has so far established the rationale for the sequential exploratory approach adopted in this thesis; and has justified the methods used and the points of triangulation. The final research design is summarised in [Figure 4.3](#) below.

Figure 4.3: Final research design



4.4 Operationalisation of methodology

Sections 4.2 and 4.3 outlined the theoretical rationale for the methodology adopted in this thesis and detailed the final research design ([Figure 4.3](#)). This section demonstrates how each method was used and how methodological issues were overcome.

- **Section 4.4.1** focuses on the operationalisation of methods in the qualitative phase of this thesis.
- **Section 4.4.2** details the operationalisation of the quantitative phase of this thesis.

4.4.1 Operationalisation of methods in the qualitative phase (RQ1-RQ3)

Semi-structured interview design

Nine semi-structured interviews were conducted with key Morrisons and industry personnel. The primary aim of these interviews was to address the first three research questions RQ1-RQ3. Interviews were conducted with seven of Morrisons' employees; one competitor; and one retail analyst to assess both internal and external industry perceptions of Morrisons' entry to market. The respondents included all but one of Morrisons' executive board; senior online and marketing directors and long-standing senior employees. A summary of the participants is found in [Table 4.3](#). It is worth noting that the respondents were representative of the management of the company, but not representative of the demographics of the UK. Seven of the nine respondents were male, all were native English speakers and all appeared to be of White British heritage. An example of the semi-structured interview guide used is shown in [Appendix E](#).

Table 4.3: Semi-structured interview respondents

Respondent code	Position	Affiliation
I1	Executive	Morrisons
I2	Executive	Morrisons
I3	Executive	Morrisons
I4	Director	Morrisons
I5	-	Competitor
I6	-	Retail analyst
I7	Long-term employee	Morrisons
I8	Director	Morrisons
I9	Director	Morrisons

Thematic analysis was used to iteratively code the interview transcripts and assign themes emerging from the nine interviews. To achieve this, a thematic codebook was produced. Three first order codes were developed with reference to RQ1-RQ3, namely: 'drivers', 'strategic change' and 'outcomes'. Second order codes were also assigned at outset:

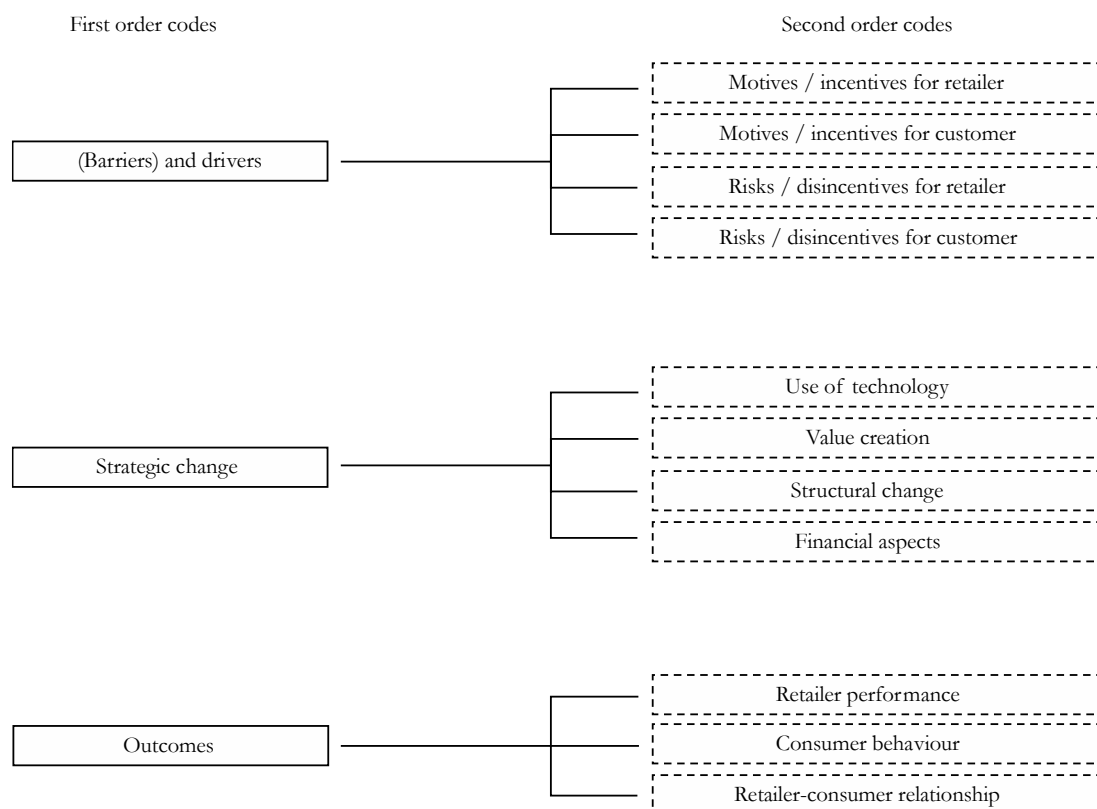
- The **drivers** code was assigned two second-order codes relating to the motivation / incentives and risks / disincentives associated with digital transformation and entry into the online grocery market.
- The **strategic** change code was assigned four second-order codes corresponding to Matt et al's four pillars of digital transformation', namely: use of technology; changes in value creation; structural changes; and financial

aspects. Morrisons' capacity to succeed in each dimension and a fifth dimension encapsulating the change in power-distribution between retailer, technology and consumer were also added.

- The **outcomes** code was assigned three second-order codes relating to retailer performance; the retailer view of consumer behaviour; and the retailer-consumer relationship.

A summary of the first and second order codes is shown in [Figure 4.4](#).

Figure 4.4: First and second order 'top down' interview coding schema



Third order codes were then iteratively assigned to one or more of these second order codes as they emerged in transcript analysis. The final codebooks are shown in [Appendix E](#).

Focus group design

Morrisons conducted three customer focus groups with the use of an independent marketing company as part of its ongoing engagement with consumers and potential consumers. The author of this thesis attended these focus groups in the summer of 2016. Three focus groups were observed - two with existing Morrisons.com shoppers; and one with other non-Morrisons online grocery shoppers. Of the two focus groups with existing Morrisons.com customers, one was conducted in Leeds – Morrisons' 'heartland'; and one in the North London area, where Morrisons has a less established brand and presence.

The focus groups consisted of 7-8 participants. The demographic breakdown of the focus groups and data taken from Morrisons' Google Analytics (GA) account from Jan-June 2016 are summarised in [Table 4.4](#). There is a likely overweighting for female users in the non-Morrisons consumer group, whilst the demographics of the Morrisons.com customer groups are close to the GA demographic estimates. Representativeness has implications for generalising findings, but this is rarely the objective of focus groups. It does however raise questions about the applicability of any findings to a more representative demographic of non-Morrisons customers.

Table 4.4: Comparison of focus group and GA estimates of demographics of Morrisons shoppers

	Focus Group	GA Estimates
Leeds Generic	86% Female	N/A
Leeds Customers	65% Female	66% Female
London Customers	61% Female	62% Female

Thematic analysis was also applied to the focus group responses. First-order codes were drawn from the literature review. The first order codes were as follows:

- product range
- devices
- price-sensitivity
- location
- gender
- time-poverty
- trust
- adoption and accessibility

The focus group observations were also analysed with respect to the four dimensions of practice (materials, symbolic meanings, competencies and temporalities) to identify practices of online grocery consumption. The points of emotional response to online grocery shopping among consumers were also identified.

Triangulation of semi-structured interviews and focus groups to address RQ1-RQ3 and to generate quantitative hypotheses for RQ4

A 'top-down, bottom-up' thematic analysis approach was used to code and interpret the findings of the semi-structured interviews and focus group observations. The 'top-down' component was drawn from the four research questions which formed first order codes for the analysis. Codes relating to Matt et al ([2015](#))'s four dimensions of analysis were also used as second order codes to consider the strategic shifts and outcomes of digital transformation. The 'bottom-up' component refers to the thematic codes that emerged from scrutiny of the qualitative data. Pseudonymous terms were grouped together and the frequency and spread of similar terms was performed to discern the most important perspectives. The potential bias of each respondent type was considered and of particular interest were those themes where there was total consensus or stark disagreement between respondents. Key quotes and code books for the thematic analysis are found in [Appendix E](#).

The findings from the thematic analyses of interviews and focus groups were used in conjunction with findings from the background literature to structure the hypotheses tested in the quantitative phase of this thesis. This was achieved by cycling through the first-order codes and interpreting the findings from the three sources. Information gleaned from the development of third order codes and from the augmentation of Matt et al's dimensions of digital transformation were used to compare and contrast the findings of this thesis and previous studies. Eight hypotheses emerged from this analysis which were subsequently tested in the quantitative phase of this thesis.

4.4.2 Operationalisation of methods in the quantitative phase (RQ4)

Data collection and processing

The quantitative work in this thesis drew upon three data sources:

- Morrisons.com Google Analytics (GA) data (proprietary source) (Morrisons, 2019)
- YouGov Profiles Lite (previously open source, now subscription) (YouGov, 2016)
- Living Costs and Food survey 2016-2017 and 2017-2018 (open government data source) ([Davies, 2017](#); [Williams, 2017](#))

All datasets required substantial processing to address the research questions in this thesis. The following sections describe the steps taken to align these three datasets.

Harmonising the YouGov and Morrisons.com datasets

The YouGov dataset was used as a proxy for the overall demographics of Morrisons consumers and other UK grocery shoppers. YouGov's survey of ~80k shoppers was conducted on 12 October 2016. As well as ascertaining the respondent's primary supermarket for grocery shopping, the survey collected respondents' age, gender, location and National Readership Survey (NRS) social grouping.

[Table 4.5](#) shows the approximate representativeness of the YouGov survey by comparing the proportion of respondents for each supermarket with the supermarkets' market share at the time of the survey.

Table 4.5: Approximate representativeness of YouGov survey

Sample size ¹	Supermarket	YouGov Sample ¹	Market share ²	Percentage point over / under representation
13,727	Sainsbury's	17%	16%	+1
8,973	Morrisons	11%	10%	+1
16,726	Tesco	21%	28%	-7
9,257	ASDA	12%	16%	-4
2,757	Ocado	3%	2%	+2
8,014	Aldi	10%	6%	+4
7,811	Coop	10%	7%	+3
5,818	Waitrose	7%	5%	+2
7,033	Lidl	9%	5%	+4
80,116				

¹ YouGov Profiles Lite – survey conducted 12 October 2016 ([YouGov, 2016](#))

² Kantar World Panel – data as at 9 October 2016 ([Kantar, 2016](#))

The Tesco group was the most underweight relative to its market share. This may reflect higher average spend among Tesco consumers, or reflect that many of the other respondents use Tesco outlets as a secondary shopping location. This would be consistent with the prevalence of Tesco convenience stores nationally.

In order to compare the Morrisons online consumers to the offline consumers from the YouGov survey, a query was performed to retrieve users who transacted in 2016 with age, gender, social grouping and location information available.

Table 4.6: Summary of Google Analytics query for extracting location and socio-economic grouping

Queried variables	Query (location, socio-economic): Revenue, quantity, datetime, spoke, mosaic
Start date	28/09/2016
End date	26/10/2016

Source: Google Analytics, Morrisons.com

The YouGov survey used non-standard regions based on the aggregation of parliamentary constituency data. In order to map Morrisons' online deliveries to the YouGov regions, the procedure outlined in [Table 4.7](#) was performed.

Table 4.7: Summary of Google Analytics query procedure for mapping to YouGov regions as at 2016

Queried variables	Revenue, users, spoke, longitude, latitude
Processing procedure	<ul style="list-style-type: none"> A sample of transactions was queried from the Morrisons GA account that included longitudes, latitudes, delivery spoke and revenue. Transactions with geolocations outside Morrisons' 2016 delivery coverage were removed (these may be due to the user travelling away from home and ordering when outside the catchment area, or due to inaccurate geolocation tracking). An approximate mapping of the YouGov regions (see Appendix I) was created using parliamentary constituency data. The value of transactions for a given spoke were apportioned to the YouGov region they were geolocated in. (e.g. the Leeds spoke might have 89% of its sales in the Yorkshire region and 11% in the North East region). This assignation was then run over the larger set of spoke-located (but not geolocated) transactions - allowing for the inclusion of desktop and other non-geolocated transactions.
Observation count in 2016 geolocated sample	227,729 transactions (before cleaning) 211,834 transactions (after cleaning)
Start date	01/01/2016
End date	31/12/2016

Source: Google Analytics, Morrisons.com

To obtain the ‘spoke-located but not geolocated’ Morrisons’ customer dataset, a larger query up to the end of 2018 was performed. The Morrisons.com dataset query engine only allowed seven ‘dimension’ variables to be queried together at any one time, so three queries were performed and joined across common variables ([Table 4.8](#)).

Table 4.8: Summary of Google Analytics query procedure for RQ4

Queried variables	<p>Query 1 (unique user ID): Revenue, quantity, datetime, user ID, transaction ID</p> <p>Query 2 (age, gender): Revenue, quantity, datetime, gender, age bracket</p> <p>Query 3 (location, socio-economic): Revenue, quantity, datetime, spoke, mosaic</p>
Processing procedure	<p>Three query results joined on {revenue, quantity, datetime}</p> <p>Where more than one age bracket/gender/spoke/mosaic assigned, the most frequent was assigned, or assigned at random if equal instances.</p>
Start date	01/01/2015
End date	31/12/2018

Source: Google Analytics, Morrisons.com

Harmonising the Living Costs and Food survey (LCF) dataset with the Morrisons.com dataset

The Living Costs and Food survey (LCF) is a national survey produced by the Office for National Statistics in collaboration with the Department for Environment, Food & Rural Affairs (DEFRA) ([Bulman, 2017](#); [DEFRA 2017a](#); [DEFRA 2017b](#)). The survey

collects information from a sample of respondents about their household spending, one aspect of which documents their grocery shopping habits.

In 2016, the LCF food survey consisted of 4,760 households who were asked to document their spending on food over a two-week period. The aggregated results were then reported as spend in pounds per week (£pw) and divided by product category, broadly in line with the Classification of Individual Consumption According to Purpose (COICOP) codes (UN, 2017). The socio-demographic profiles of respondents were collected to map the results of this sample back to the parent population.

The LCF forms the most complete estimate of national spending on food and drink, despite the relatively small sample size. The LCF was used as a ‘population proxy’ in this thesis to represent spending at the national level.

Whilst this thesis looks specifically at the grocery shopping behaviours of Morrisons customers, it also establishes the extent to which the Morrisons sample can be used to investigate online grocery shopping at the national level.

To establish whether the composition of Morrisons’ online baskets was comparable with national estimates for online and offline baskets, an analysis of basket composition by food category was conducted (Section 6.6). This included re-weighting of the Morrisons sample to reflect the increased proportion of Morrisons’ customers located in the ‘North West’ and ‘Yorkshire and the Humber’ regions.

Table 4.9: Estimated location of Morrisons’ sample versus ONS mid-year estimate, 2015

Region	Morrisons sample	Mid-year 2015	Percentage point diff.
West Midlands	13.9%	8.7%	+5.2
South East	4.7%	15.3%	-10.6
North West	13.9%	10.9%	+3.0

East	3.0%	10.2%	-7.2
Yorkshire and The Humber	21.5%	7.8%	+13.7
South West	5.7%	9.2%	-3.5
East Midlands	11.3%	7.5%	+3.8
London	25.4%	13.4%	+12.0
North East	0.3%	3.6%	-3.3
Scotland	0.1%	8.8%	-8.7
Wales	0.2%	4.6%	-4.4

Proportion of Morrisons' customers by location compared to 2015 mid-year population estimates (Morrisons, 2019b; Park, 2019).

Aligning products purchased by Morrisons consumers with the COICOP codes was not trivial. To reduce the number of poorly categorised foods (e.g. ready meals containing a number of ingredients), several of the COICOP groups were combined. The final food categories used to compare the LCF and Morrisons.com datasets is shown in [Table 4.10](#).

Table 4.10: Composite food categories derived from COICOP codes

Food category	Description
Bread & cereals	Bread, pasta, lentils, pulses, savoury biscuits and buns, breakfast cereals, corn-based products, quiches, pastries, non-meat pies
Fruit & veg	Fresh, dried, frozen and processed fruit and veg, excluding potatoes
Potatoes	Fresh and frozen potato products including chips and crisps

Meat	Fresh, cured and frozen meat products, including meat pies
Fish & seafood	Fresh, processed and frozen fish, including battered fish
Dairy & eggs	Fresh and dried milk, cream, yoghurts, eggs and dairy substitutes
Confectionary	Biscuits, cakes, sweet buns, sweets, chocolate, ice-cream, jelly, sugar, jams and sugared spreads
Other	Including soup, seasoning, baby food, butter, vegetable oils and protein food replacements
Non-Alc. Drinks	Beverages not containing alcohol, including tea and coffee

The Morrisons Sample consisted of 986,973 transacted food and drink items from 41,201 users/households obtained using the Google Query Explorer API.

In order to align these transaction events to the LCF, 31,721 Morrisons products corresponding to those transacted by consumers in the year in question (2016 or 2017) were labelled with one of the categories in [Table 4.10](#) and were also labelled ‘fresh’ or ‘not fresh’. This process was initially done semi-manually with key-word matching. Once a corpus of categorised products had been established, these were used to categorise the remaining products by comparing the textual similarity of the unlabelled products to each of the categorised products.

Statistical significance of results

Descriptions of the statistical tests used to address the hypotheses of the quantitative phase follow in [Table 4.11](#).

Table 4.11: Statistical tests used to test hypotheses in the quantitative phase

Hypothesis number and null hypothesis	Statistical test/measure	Justification/function
H1: “Online is going well”	Operating profit margin, Economic profit, Nominal revenue, Real (CPI adjusted) revenue Demand and supply side effects	Limited breakdown of financial measures between online and offline performance for all UK firms. Overall profit measures were used to compare company and shareholder value. Demand and supply effects were examined to qualify Morrisons’ position in the sector. Change in revenue over time was used to track Morrisons’ online performance since inception.
H2: The demographic composition of online consumers is broadly similar to offline consumers	-	Very large sample size. Sample considered to be representative of population so trends interpreted at the population level.
H3: Online consumers are price-sensitive	-	Large sample size reduced the power of statistical tests. Sample considered to be representative of population so trends interpreted at the population level.
H4: Online consumers are ‘time-poor’		
H4.1 <i>Time-on-site per transaction</i> in 2017 versus 2018	Mann-Witney one-tailed U-test	Non-parametric test to test whether two sample means from the same population are equal.
H04.2 <i>Time on site per transaction</i> for one-day shoppers versus multi-day shoppers	Mann-Witney one-tailed U-test	
H04.3 <i>Time on site per transaction per day</i> for one-day shoppers versus multi-day shoppers	Mann-Witney one-tailed U-test	
H04.4 <i>time on site per transaction</i> for one-day shoppers in 2017 versus 2018	Mann-Witney one-tailed U-test	

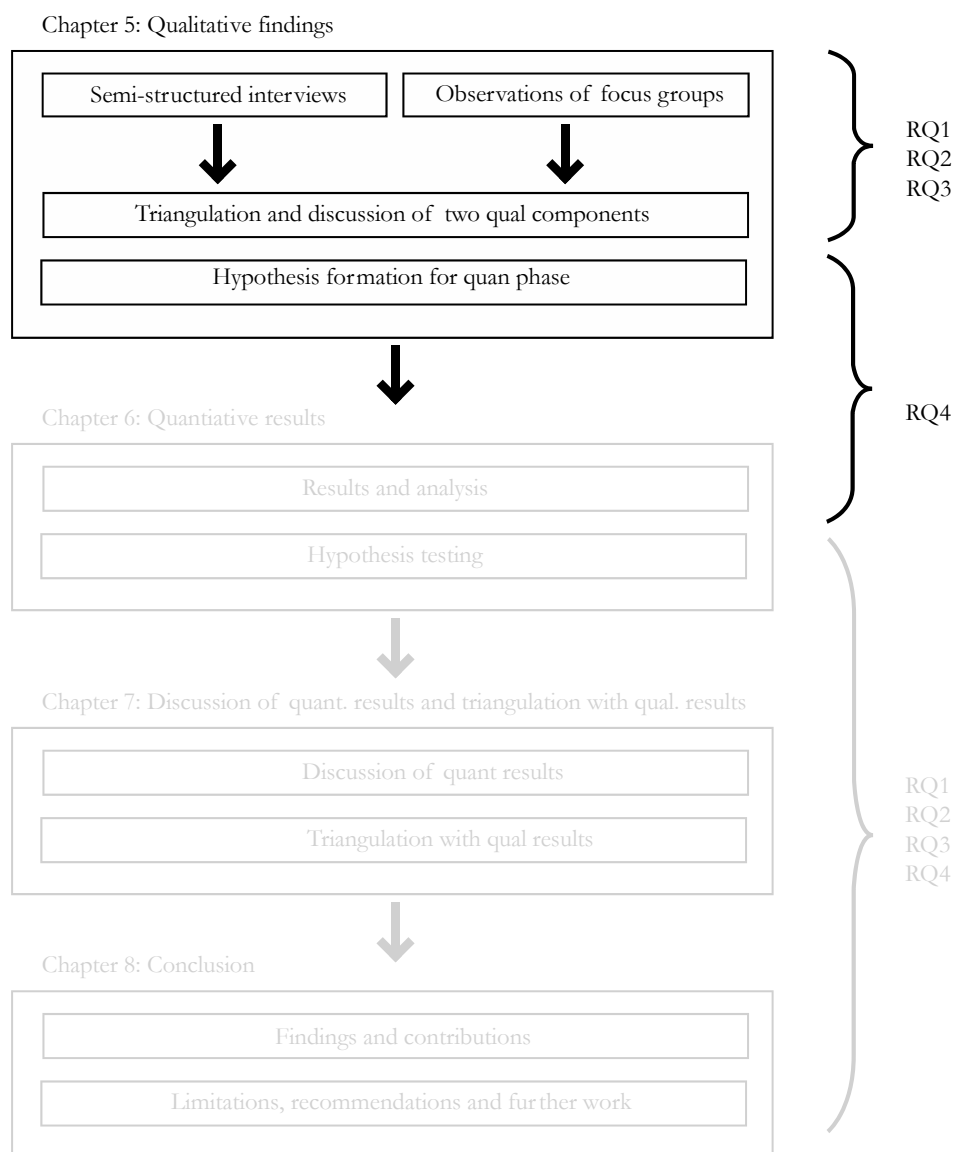
H04.5 <i>time on site per transaction</i> for multi-day shoppers in 2017 versus 2018	Mann-Witney one-tailed U-test	
H5: It is difficult to disrupt online baskets	-	Very large sample size. Sample considered to be representative of population so trends interpreted at the population level.
H6: Basket composition is the same online and offline		
H6.1 Channel of purchase versus food category at the national level in 2016	χ^2 -test of independence and Bonferroni correction	Used to determine whether there is a significant relationship between two categorical variables.
H6.2 Channel of purchase versus food category at the national level in 2017	χ^2 -test of independence and Bonferroni correction	
H6.3 Proportion of basket by food category for Morrisons online sample versus LCF online sample in 2016	χ^2 goodness-of-fit test	Used to compare observed sample distribution with expected distribution.
H6.4 Proportion of basket by food category for Morrisons online sample versus LCF online sample in 2017	χ^2 goodness-of-fit test	
H6.5 Proportion of basket by food category for re-weighted Morrisons online sample versus LCF online sample in 2016	χ^2 goodness-of-fit test	
H6.6 Proportion of basket by food category for re-weighted Morrisons online sample versus LCF online sample in 2017	χ^2 goodness-of-fit test	
H7: Device and screen-size do not affect average basket size		
H7.1 The average basket value is the same among desktop, tablet and mobile purchases, i.e. ($\mu_{\text{Desktop}} = \mu_{\text{Tablet}} = \mu_{\text{Mobile}}$)	One-way ANOVA and Tukey HSD	Non-normal data, but since the ratio of variances suggested that the one-way ANOVA would remain a robust measure (Kirk, 1995).
H8: Consumers are disloyal	Loyalty scale: Very loyal to disloyal	Comparison with retention rate (unbounded)

Source: Statistics solutions ([2019](#))

5. Qualitative findings and discussion

This section presents findings and analysis of the qualitative phase of this thesis and derives the hypotheses addressed in the quantitative phase.

Figure 5.1: Final research design – qualitative phase



This chapter is organised as follows. Sections 5.1-5.3 gain insights from semi-structured interviews with key Morrisons personnel, a competitor and a retail analyst; and from focus groups with Morrisons and other online grocery shoppers. These insights are triangulated and used to address the first three research questions.

Finally, Section 5.4 draws upon findings from the literature review and triangulates findings in Sections 5.1 to 5.3 to present eight core hypotheses relating to the outcomes of digital transformation for retailer and consumer practices. These are tested in the quantitative phase of this thesis (Chapter 6).

- **Section 5.1: Drivers of digital transformation in the UK's grocery market (RQ1)**
- **Section 5.2: Strategic change in digital transformation (RQ2)**
- **Section 5.3: Outcomes of digital transformation (RQ3)**
- **Section 5.4: Triangulation of findings and development of hypotheses for quantitative analysis (RQ3, RQ4)**

5.1 Drivers of digital transformation in the UK's grocery market

5.1.1 Interviews – retailer drivers of digital transformation

This section provides an analysis and discussion of the semi-structured interviews with seven key Morrisons' personnel, a competitor and a retail analyst. Key selected quotes from the interviews are shown in [Table 5.1](#). A more complete set of selected quotes

guiding this analysis are found in [Appendix E](#). The ‘top-down, bottom-up’ thematic approach used was outlined in Section 4.3.

The general consensus among Morrisons’ executives; a market analyst; and an e-commerce competitor was that Morrisons’ entry to market was primarily defensive - that of recapturing customers and not giving previously loyal customers a reason to shop elsewhere. It was in this sense driven by customer demand and market pressure, not by a desire to exploit multi-channel opportunities. This reluctance to join mature markets is well documented, with Fuentelsaz et al (2015) citing a lack of financial incentives as a key force in deterring incumbent digital transformation. Specifically, Agarwal et al (2010) highlighted initial outlay and ongoing maintenance costs of digital transformation as barriers to entry in the healthcare market. Kohli (2011)’s discussion of the digital transformation of the oil industry focused on the cost and effort to digitise expensive and bespoke drilling equipment. This resonated with the high investment costs made by online grocery providers in logistics, refrigeration, training and warehousing.

Table 5.1: Representative quotes relating to the drivers of (and barriers to) Morrisons’ digital transformation (addressing RQ1)

Quote	Emergent code
...partly defensive...we don’t want customers to shop with other people because they can’t shop with us. I9	Defending customer base
There wasn’t really a choice of not going online... I think you would have been facing constant drain on your sales line, which at some point then, suppliers go, well you’re buying as much so I’m not giving you as favourable terms... you’ve really got to do it at some point. I2	Maintaining supplier terms
online grocery business cases have been founded on recovering a level of delivery income...we’ve got to work that out as an industry. I don’t think we make enough money as an industry, I think we need to be clever around how we do that. I9	Making profit online is hard
...there is [sic] a lot of our customers who are very time-poor, want to shop online...it is a convenient way of doing shopping. I1	Time poverty, convenience

I think customers are quite price sensitive. And even those with lots of money, they are very savvy. I3	Price sensitive
It is a very disciplined shop, there is no pester power in the store because I'm shopping at home in my own time with my laptop and the kids are out of the way so there is no pester power. I4	Discipline, skilful, price-sensitive
I like to go and pick my own stuff because I feel as though if I'm doing online stuff, I'm going to miss an opportunity...I won't see the new ranges that have been introduced. I1	Experiential element missing online
Nobody, nobody wants bad service no matter where they go. You never return to a restaurant if you have a bad meal or if you had to wait too long for it to come out, you just never go back, ever... [key considerations are] service, availability, price. I1	Service, product range, price

Mascarenhas ([1992](#))'s finding that first entrants that survive maintain higher long-term market shares than later entrants may also reflect Morrisons' reluctance to be the last of the major retailers to join the online grocery market. Despite this, there was a sense of inevitability expressed by Morrisons personnel. Mithas ([2013](#)) highlighted normative competitive pressure as a key component of digital strategy. They differentiated between firms who mimic others (converge); and those who differentiate from others (diverge). In the case of Morrisons' entry, the move online can be thought of as convergent. However, the method of doing so - by enlisting the expertise of Ocado - was unique (divergent) in the industry. This suggests that there may have been a more complex interplay of normative and innovative practices in Morrisons' entry to market.

In the case of Morrisons, the exogenous pressures were almost unanimously portrayed as 'negative' drivers for digital transformation. These pressures have not been universally seen as negative however. Loebbecke ([2015](#)) identify opportunities to gain competitive advantage from digital transformation; Stielglitz ([2012](#)) highlights the opportunities of ubiquitous data access and unified communication; and Setia ([2013](#)) see

digitisation as a chance to better sense and respond to consumer needs. Some respondents did cite going online as an opportunity to attract new customers and a more diverse consumer demographic. For Morrisons, this could mean an increase in its younger consumer-base, since 62% of Britons aged 25-34 shop online for groceries ([Mintel, 2017](#)). That said, it has been reported that older consumers in the UK are the most likely in Europe to shop online ([Watts, 2016](#)), with nearly 80% of pensioners having made an online purchase.

There was little evidence of endogenous, employee driven pressure to enter the online grocery market at Morrisons prior to Dalton Phillips' tenure, as admitted by a senior and long-standing executive (I3). The realisation of the move online has been driven by current CEO David Potts and newly employed digital team members. Westerman ([2011](#))'s assertion that successful digital transformation must be driven from the top would indicate that this was no bad thing for Morrisons.

As the last of the major retailers to join the online grocery market, Morrisons were incontrovertibly 'late to market'. Despite expressing negative sentiments about the reasons for joining the online market, most of the Morrisons' personnel didn't see the late market entry point as a bad thing, citing the ability to learn from the mistakes of others as advantageous, in accordance with Kohli ([2011](#)). Gilbert and Lieberman ([1987](#)) suggested that watching a number of competitors enter a market serves to reduce the uncertainty in outcome to other incumbents. Where this rationale comes somewhat unstuck in the case of Morrisons is in the assessment of its recent disastrous late entry to the convenience market. Debruyne and Reibstein's suggestion that: "Contagion can result from blind imitation of others' behaviour." ([Debruyne and Reibstein, 2005](#), p. 57), could account for why Morrisons pursued their late entry to the online market alongside a complete divestment from the convenience market. Debruyne and Reibstien ([2005](#))'s encapsulation of this 'economically irrational' response might indicate that Morrisons'

entry to the online might be as doomed to failure as convenience was (I2). Alternatively, it could be that the characteristics of the 'location-less' online market are more accommodating of late entrants.

The first substantive entrant to online grocery shopping in the UK was Tesco, who remain the dominant player in the market. However, the UK's online grocery market hasn't seen any permanent casualties among the large retailers. Iceland and Asda's first attempts to enter the market was abandoned, nevertheless, both brands now have established market positions in the sector. Palley (1995) remarked that 'imitative' behaviour is particularly prevalent among risk averse firms. Morrisons' identity as a traditional grocer with a historically hostile attitude to market innovations and 'fads' would support the characterisation of being risk averse.

Only the retail analyst seemed to see a real financial incentive for Morrisons joining the online market, remarking that multichannel users spend more, in agreement with Ansari et al (2005). A competitor questioned the decision to enter the market, given that Morrisons was offering nothing new in terms of product or service above and beyond current providers. Morrisons' failed entry to the convenience market presents evidence that entering a market just to try to regain market share does not always serve the company well.

[Table 5.2](#) summarises the empirical findings with respect to the barriers and drivers of Morrisons' entry to the online supermarket, comparing responses to previous studies.

Table 5.2: Codebook and findings for first order code: (barriers and) drivers – retailer / industry

First order code	Emergent code	Key findings	Comparison with prev. lit.	
Barriers	<i>Retailer perspective</i>	Difficult to make online profitable Market coverage already close to 100% in UK Market cannibalisation occurring	Agrees	Lack of financial incentives, e.g. Fuentelsaz et al (2015) Lower market share and cannibalisation, e.g. Mascarenhas (1992)
			Disagrees	Cost saving, e.g. Bharadwaj et al (2013); Loebbecke (2015)
	<i>Perception of consumer</i>	Opportunity cost of shopping online and not getting exposure to best deals in-store Online lacks experiential richness and sociality, tangible goods Inappropriate substitutions annoy customers	Agrees	Dislike substitutions, e.g. Hand et al (2009), Don't want to shop for fresh produce online, e.g. Kestenbaum (2017); Marino (2015)
Drivers	<i>Retailer perspective</i>	Defensive - to regain / protect consumer-base To attract a new demographic? Acceptance of longevity of online market Multi-channel customers higher value?	Agrees	No financial incentives, e.g. Fuentelsaz et al (2015) Multi-channel spend more, e.g. Ansari et al (2008)

		Disagrees	Spend depends on product category, e.g. Kushwaha and Shankar (2013)
<i>Perception of consumer</i>	Expect online ordering option	Agrees	Time-poor, e.g. Wajcman (2014)
	Expect the full range of products to be available online		Complete shop in seconds, Robinson (2007)
	Price-sensitive, price-savvy, online shop is disciplined	Disagrees	More time and money spent online, e.g. Michaud Trevinal (2014); Degaratu (2000); Wang et al (2015)
	Time-poor, value speed and convenience		

5.1.2 Focus groups – consumer drivers of digital transformation

The focus group questions and prompts centred on finding out how consumers were using online delivery, what their motivations for using it were and how they felt about the current offering from Morrisons and other online retailers. [Table 5.3](#) summarises nine key themes (those mentioned frequently and across several group members) that emerged from the discussions as features of importance driving focus group participants online (or driving them away). It also lists the pseudonymous terms and concepts used by participants in the two groups in referring to these concepts. Together these themes and use of language help to scope out how consumers are using the technology and what is important to them when grocery shopping online.

Table 5.3: Codebook and findings for first order code: (barriers and) drivers – consumer

Emergent themes	Leeds	London
<i>Value</i>	Cost, offer, offers first, promotions first, best value	Value for money, Good price, competitive, offers
<i>Quality</i>	Date/out of date, quality, poor quality, up their game, streets ahead	Value range (poor quality), natural ingredients, dated, modern, Best of British, high meat content
<i>Convenience</i>	Easy, favourites, don't have a list	Hour delivery, app, Click and Collect, Favourites
<i>Service</i>	Missing, smashed, substitutes, replacements, reliable, no-quibble, no questions asked, happy	Customer service, polite, friendly
<i>Rewards</i>	Vouchers, redeem	Incentives
<i>Boredom/ routine</i>	Not very exciting	Boring
<i>Image/perception</i>	Modernising, lost their way	Colours, posh, posher, old-fashioned
<i>Range</i>	Choice, alternatives, range, non-standard, every day, get in-store but not online, fresh-baked bread	In store but not online, bakery, Variety

Site navigation

Search

Search, click on offers

Most respondents cited 'value' as a significant driver for their choices, whether online or offline. They were keen to emphasise that this did not mean 'cheap and cheerful', but that it entailed the balance of price and quality. For some, online had surpassed their expectations in-terms of freshness, whilst others preferred to select their own perishable goods and choose the longest dated products on the shelves.

The most appealing features of online shopping for respondents were the convenience of not needing to leave the house; and the ability to use search and site navigation to find deals. Consumers also appeared to be using the affordances of the technology to aid them in their provisioning role, signalling a technology-enabled change in shopping practices:

I use it as my shopping list, so when I need something, so instead of writing it down on a piece of paper, I just put it straight into my basket. (FG1)

The downsides of shopping online included the inability to acquire short-dated fresh items such as bread and cakes reliably; the restricted range online and the boredom of online shopping. This resonated with the perception of the retailers, who felt that the experiential element was sparse in online grocery shopping.

5.2 Strategic change during digital transformation

5.2.1 Interviews and focus groups – retailer strategic change during digital transformation

Not only was Morrisons the last of the ‘Big four’ supermarkets to join the online grocery market, it was also beaten to market by Waitrose and pureplay retailer Ocado. Morrisons’ identity as a ‘traditional retailer’ not readily engaged with technological innovation has finally begun to shift, following its 2014 entry into the UK’s online grocery market. Analysis of the extent and effects of this ‘digital transformation’ from the perspective of key Morrisons personnel, a competitor and a retail analyst follow. Key quotes can be found in [Appendix E](#).

In analysing the strategic shifts evident in the narratives of Morrisons personnel, a competitor and a market analyst, it is poignant to revisit Matt et al’s four dimensions underpinning digital transformations in business Matt et al ([2015](#)):

- **Use of technologies** — a company’s attitude towards and ability to exploit new technologies.
- **Changes in value creation** — impact of digital transformation strategies on a firm’s value chains, i.e. how far the new digital activities deviate from the classical business.
- **Structural changes** — variations in a firm’s organisational setup, especially concerning the placement of the new digital activities within the corporate structures.
- **Financial aspects** — these include a firm’s urgency to act owing to a diminishing core business and its ability to finance a digital transformation

endeavour; financial aspects are both a driver and a bounding force for the transformation.

In the analysis that follows, the contribution to each dimension from the Morrisons case study is highlighted.

Use of technologies

The interviews with Morrisons executives, directors and longstanding employees suggested that Morrisons' attitude to technology had altered dramatically among even the least technologically experienced long-standing board members. Respondents described technology as no longer being a barrier to progress. They expressed a sense that the firm had 'grown up' and showed appreciation of multi/omni-channel as a persistent feature of retail going forwards.

Morrisons' capacity to capitalise on the opportunities and challenges of new technologies was less well articulated. One director remarked upon the likely negative outcomes of entering the market without full market analytics in place; and the relative inexperience of the team with the digital marketing. Despite some reticence in digital marketing and analysis, the deal with Ocado was bold and unprecedented in the UK grocery market. In one sense, Morrisons chose the 'road less travelled' by engaging in a symbiotic, 'coopetitive' relationship with Ocado; in another, it acknowledged Ocado as the market leading firm in terms of technological and logistical fulfilment of UK grocery delivery, reducing risk by investing in 'tried and tested' technologies.

The reasons cited for Morrisons not entering the online grocery market sooner were in part financial (see below), but also reflected a broader cultural reticence. Morrisons' executives and employees expressed:

- a lack of technological expertise (the importance of upskilling for successful digital transformation has been expressed by Bharosa et al ([2013](#)), Agarwal et al ([2010](#)) Tamm ([2015](#)), Setia ([2013](#)), Chen et al ([2014](#)) and Schuchmann ([2015](#)))
- a lack of capability to embrace the new technology
- a sense that online was not their strength or concordance with their identity as a traditional retailer
- a belief among the previous CEO/senior team that technological fads would not take hold.

Whilst it was unanimously acknowledged that Morrisons was late to market, most Morrisons' respondents did not reflect on this as a bad thing. Respondents cited the opportunity to learn from mistakes of others, in agreement with Kohli ([2011](#)). In contrast to traditional reports of 'first mover advantage', more recent papers have suggested that being first to market is less important in e-commerce than offline ([Mellahi and Johnson, 2000](#)). Focus group respondents were less happy about the delay in entering the market, and contrary to the assertions of a Morrisons competitor, they expressed demand for the online offering, "Everyone switched at the same time ...very late to the party...everyone was waiting for them."

Previous studies have suggested that culture change is vital for successful digital transformation ([Janowski, 2015](#); [Tamm, 2015](#)). Morrisons' respondents suggested that there has been a cultural shift at the company. Morrisons has become a more technologically confident, but there remains a lack of experience in the area, even with recent hires to bolster knowledge in the area. The language used by most Morrisons executives remained cautious — reminiscent of their identity as a traditional grocer,

resistant to change. Advertising, marketing and articulating the brand's USPs has been issues in the past. These weaknesses are perhaps amplified in the digital era by the intangibility of its USPs, a lack of experience in the digital marketing and perhaps even the existential issue of bringing 'nothing new' to the table.

Changes in value creation

Morrisons' entry to the online grocery market has displayed limited innovation in terms of the product or service on offer. The website interface on Morrisons.com is a clone of Ocado's and Morrisons offer a subset of the products available in its physical stores.

Where Morrisons has added to the market place is in extending the service quality of Ocado (known for its low substitution rate and doorstep service) to a less affluent customer base. The deal with Ocado is itself also unique in the market, representing the first truly cooperative relationship in the UK's online grocery space. There was a sense among Morrisons' executives that by going online, Morrisons has perhaps lost flexibility, but improved consumer proposition. This resonated with the general feeling that the online grocery market was consumer-driven and that there had been of a shift of power to the customer in this regard. Whilst Morrisons' traditional grocer identity has been blamed for thwarting innovation, it may also be the source of their online value proposition. Respondents cited the role of re-engagement with the brand and its traditional USPs: value, quality, fresh and reversing the move away from things that were working, like its 'The Best' range. The Leeds group were acutely aware of Morrisons as an incumbent retailer with a rich history in the north, with one participant expressing sadness at Morrisons' recent poor performance, "It kinda makes me sad

sometimes when I see in the news about Morrisons not doing so well, so I've kind of got a connection to them".

Interview respondents were keen to articulate that the online strategy was customer focussed in its design, with 'making things easier to shop' a priority. Despite this, there prevailed a sense of fear and misunderstanding of the modern consumer in many responses. Long-standing executives reeled at how quickly technology has been adopted and changed; and how there are disparities among and between demographic groups. Among focus group respondents, there was also uncertainty about personal data and personalisation. Some were reticent, whilst another saw their data as a valuable transactional good,

It could be like Amazon, you know, 'we see you make a lot of stir fries, have you tried this sauce' ...I don't mind that, it is a bit 'woo', but actually...it's nice to personalise it. (FG2)

Several interview respondents cited the importance of making online experiences experientially' nourishing, although there was little conception of how this might be achieved in grocery. How Morrisons will continue to innovate and adapt was not covered in any detail by respondents, although the deal with Amazon was cited as a good strategic hedge in the face of Amazon's encroachment on the online grocery market.

Structural changes

Lee and Grewal (2004) conceptualised a firm's response to a technological innovation as intensity along the spectrum of responses. The extremes of the firm's response being non-adoption and re-engineering the core business to accommodate new technology. The intensity of Morrisons' response to the technological advances facilitating online

grocery shopping is not easy to quantify. On the one hand, Morrisons' entry to the online grocery market has been somewhat siloed from the core business by the decision to partner with Ocado, thus employing a hub-and-spoke rather than store-pick model. By using centralised warehouses, the core physical stores are not intrinsic to the online service as would be the case had a store-pick model been employed. Chatterjee (2010) suggests that cross-channel retailers that adopt coordinated order online–purchase offline strategies can be more profitable than those who employ multiple channels independently. This perhaps suggests a low intensity entry to market, consistent with Morrisons' historic caution with respect to innovation — particularly following the recent failure of convenience.

This approach does not however prohibit a hybrid model with store-pick in certain locations in future, with the Morrisons' marketing team foreseeing adding a click-and-collect function in future. The augmentation of the hub-and-spoke model with store 'spokes' has in fact transpired in recent months. There was awareness of branding and reputation management in hybrid systems - particularly where geographies of store-pick and hub-and-spoke butt up against one another. Marketing has been identified by competitors and analysts as one of Morrisons' weaknesses. With little experience in digital marketing this weakness could be exacerbated if a hybrid model is adopted.

On the other hand, management of Morrisons' largely in-house manufacturing supply chain has had to adapt to the new dualism of the business. Morrisons has also taken the opportunity to embrace the digitisation of its stock control system, having rejected Safeway's market leading technology during the 2005 acquisition. This dichotomy might

suggest Lee and Grewal's model is too simplistic to capture the complexities of market entry ([Lee and Grewal, 2004](#)).

The deal with Ocado allowed Morrisons to enter the market quickly, saved on development costs and leveraged the market-leading logistical expertise of Ocado. This resonated with the findings in the oil and gas industry, where a 'buy not build' approach has been favoured ([Tamm, 2015](#)). In contrast, the Healthcare sector has tended to develop technologies in-house due to bespoke requirements ([Agarwal, 2010](#)). In contrast, the Morrisons digital team highlighted the importance of keeping the marketing and analytics in-house in order to maximise profits (despite having an inexperienced team). This focus on using the platform for tracking consumers more effectively; and communicating with customers via instant messaging reflects the attempts to modernise, improve the customer proposition and use technology more effectively. Westerman ([2011](#)) have suggested that CEO driven strategic change is key to success. The fact that CEO David Potts is pushing for this consumer and technology-driven approach bodes well for Morrisons.

There was acknowledgement among Morrisons' executives and employees that technology will continue to evolve, and so the digital transformation and adaptation process will be on going. Schadler found that a fifth of 1,600 firms surveyed think their digital transformation is 'done and dusted' and a further fifth have no immediate plans to undergo digital transformation ([Schadler, 2018](#)). These findings suggest that Morrisons are in a stronger position than many, despite being so late to join the online market.

Financial aspects

Whilst there was no denying that Morrisons was late to market in the online grocery sector, its status as the fourth largest supermarket retailer in the UK gave it financial

resilience to weather the storm of being late to the party. This was evident in their ability to turn a profit in the year following their failed entry (and subsequent full divestment) from the convenience market. That said, one senior executive did pinpoint a missed opportunity in not offering to buy Ocado - a decision they felt would make the process of moving online costlier overall.

Several respondents noted a lack of evidence of profitability in the online grocery as a key component in Morrisons' late entry to market. The UK grocery market appears to be primarily consumer demand driven. No firm has provided irrefutable evidence of profitability operating in the online grocery market and yet firms continue to join the market, seeking to preserve their consumer-base. This seemingly paradoxical market activity suggests that it is worth considering a new set of barriers and motives to entering demand driven markets, that of negative incentives. In the case of Morrisons this presents itself as the opportunity cost of not entering the market.

Another financial reason often cited for incumbent reluctance to join the online market is market cannibalisation, where by providing a multi-channel offering a retailer doesn't gain more customers, but just converts a consumer from an offline to an offline consumer. This has grave financial implications in the case of online grocery shopping – which is a far more labour and cost intensive way of servicing customers. Fueltensaz et al (2015) the resultant 'cannibalisation' of the existing customer base.

Furthermore, the UK's online grocery market is saturated — coverage of around 95% of the UK demands that Morrisons must steal consumers away from established retailers such as Tesco, Sainsbury's and of course, Ocado.

Morrisons' executives also pointed to the all-consuming task of rebranding and encompassing Safeway into the Morrisons brand as an impediment to entering online. It was however argued by one market analyst that this 'whitewashing' of the Safeway brand was a mistake. Preoccupation with prior strategic commitments has been a limiting condition in several studies to date ([Tushman and Anderson, 1986](#); [Hill and Rothaermel, 2003](#)).

In summary, [Table 5.4](#) shows how Morrisons' fits in Matt et al's dimensions of (successful) digital transformation. Two columns relating to the 'capacity to enact' each dimension have been added to help contextualise Morrisons and online grocery shopping within the broader digital transformation space. The next section reflects on the outcomes of Morrisons' digital transformation and proposes an extension to Matt et al's four dimensions of digital transformation.

Table 5.4: Summary of Morrisons' entry to online grocery market in terms of Matt et al's four dimensions of (successful) digital transformation

Dimension	Capacity to enact dimension		Explanation
	Morrisons-specific	Market-specific	
<i>Use of technology</i>	Medium	High	Use of technology includes the resources and capabilities to exploit technologies. Morrisons have embarked upon a cultural overhaul, including a condensing the executive board, but remain inexperienced in online marketing and consumer analytics. The deal with Ocado is unprecedented in the industry, but also risk averse in terms of outsourcing to experts rather than developing in house.
<i>Changes in value creation</i>	Medium	Medium – high among specialist retailers	Morrisons' executives, competitors and analysts alike were unable to pinpoint clear innovation in Morrisons' entry to market, except to offer Ocado's market-leading customer service at Morrisons' lower price point. More broadly, Morrisons online customers stand to benefit from the generally cited benefits of online including convenience and time-saving. The executive team did highlight the importance of maintaining skilled people (e.g. butchers) and managing their own supply chain and manufacturing - claiming this gave

them a point of difference. It was acknowledged by a competitor that this was where Morrisons' core value-creation potential resided.

<i>Structural changes</i>	Medium	High	Leveraging Ocado's established and market leading hub and spoke model bodes well for Morrisons' offering. The integration of its supply chain and digitisation of stock ordering support this transition. However, the online offering has been siloed from offline offering. Morrisons have begun to use stores as 'spokes' to increase reach but there is no omnichannel offering at present.
<i>Financial aspects</i>	Low	Low	The industry as a whole has shown little evidence of the profitability of online grocery shopping. Morrisons' executives and employees were clear that the move online was not profit seeking but defensive - in order to slow the exodus of customers to competitors.

5.3 Outcomes of digital transformation

5.3.1 Interviews – retailer perspective on outcomes of digital transformation

Perceived performance following entry to market

Morrisons' executives were positive about their performance since entering the online market, despite expressing reticence about the potential profitability of the channel when discussing the drivers and risks of entering the market. Executives claimed to be increasing sales volumes and recapturing customers since embarking on online. The Morrisons' competitor was unsurprisingly less optimistic about Morrisons' performance and did not imagine that their key competitors saw Morrisons' market entry as a threat. The 'double jeopardy effect' (Danaher et al, 2003), whereby retailers with lower market shares suffer from lower brand loyalty supports this assertion.

The major criticisms from inside Morrisons' was an overly cautious roll-out of the online service. This is consistent with Morrisons' conservative identity and perhaps also reflects a renewed caution following the disastrous entry and subsequent divestment from the convenience market. The deal with Ocado was praised for providing excellent door-stop service and low levels of substitutions.

One striking sentiment in the discussions with Morrisons' executives and employees was a perceived shift in power from the retailer to the consumer. Since the 1930s, the industry had been enticing consumers to 'do the work' - travelling out of town to big stores, selecting their own products, packing them into their trolleys and cars and transporting them home. Home delivery reverses this trend. It was universally expressed by respondents that online grocery shopping was consumer demand driven and did not present much opportunity to increase profits for incumbent retailers. Despite some respondents expressing uncertainty about this power shift and the role of technologies in the future, they were also keen to suggest that technophobia was no longer a characteristic of Morrisons' identity. This power-shift has been facilitated by the pervasiveness of the web and the relative ease with which consumers can browse, order and compare products online without extensive technical knowledge. The situation for the traditional retailer is reversed. There is great potential in the 'Big Data' collected, but the payoffs are slow. Morrisons' claims to be no longer 'technophobic' puts it in a better position than previously, but as the digital team acknowledged – they are a long way away from exploiting data to maximise customer spend and acquire customers efficiently. Furthermore, there appeared to be a renewed sense of fear of consumers among some respondents. One noted that consumers are able to 'keep each other informed' and there was some sense among the more long-standing employees did not understand or recognise the new, web-enabled consumer. This customer-machine-retailer dynamic is not well articulated in Matt et al's four dimensions of digital transformation but is important for clarifying the power-balance or symmetry and

interplay of the human agents (customers and retailers) and the technologies that empower them (Vass and Munson, 2015). Table 5.5 shows how a fifth dimension, 'Distribution of agency' can be added to Matt et al's dimensions of digital transformation for Morrisons' entry to the online grocery market.

Table 5.5: Augmentation of Matt et al's four dimensions of digital transformation

Dimension	Capacity to enact dimension		Explanation
	Morrisons-specific	Market-specific	
<i>Use of technology</i>	Medium	High	Use of technology includes the resources and capabilities to exploit technologies. Morrisons have embarked upon a cultural overhaul, including a condensing the executive board, but remain inexperienced in online marketing and consumer analytics. The deal with Ocado is unprecedented in the industry, but also risk averse in terms of outsourcing to experts rather than developing in house.
<i>Changes in value creation</i>	Medium	Medium – high among specialist retailers	Morrisons' executives, competitors and analysts alike were unable to pinpoint clear innovation in Morrisons' entry to market, except to offer Ocado's market-leading customer service at Morrisons' lower price point. More broadly, Morrisons online customers stand to benefit from the generally cited benefits of online including convenience and time-saving. The executive team did highlight the importance of maintaining skilled people (e.g. butchers) and managing their own supply chain and manufacturing - claiming this gave them a point of difference. It was acknowledged by a competitor that this was where Morrisons' core value-creation potential resided.
<i>Distribution of agency</i>	Low	Medium	Online grocery market is consumer demand driven. Consumers are able to leverage online technologies to readily compare products between retailers and now do less work – no longer travelling to the supermarket, processing products or transporting them. Morrisons' skillset as a traditional retailer constrained by interfacing with web-technologies and unfamiliarity with channel. They claim to be no longer 'technophobic' but have limited capacity and skills to make the most of the new communication and data-analytical opportunities. The deal with Ocado is an

			example of ‘buying in’ this expertise with respect to the logistics of home delivery.
<i>Structural changes</i>	Medium	High	Leveraging Ocado’s established and market leading hub and spoke model bodes well for Morrisons’ offering. The integration of its supply chain and digitisation of stock ordering support this transition. However, the online offering has been siloed from offline offering. Morrisons have begun to use stores as ‘spokes’ to increase reach but there is no omnichannel offering at present.
<i>Financial aspects</i>	Low	Low	The industry as a whole has shown little evidence of the profitability of online grocery shopping. Morrisons’ executives and employees were clear that the move online was not profit seeking but defensive - in order to slow the exodus of customers to competitors.

[Table 5.6](#) shows how the model could be used to differentiate between market players.

The profiles for late entrant Morrisons are shown alongside first mover Tesco and ‘pureplay’ entrant Ocado.

- Tesco have enjoyed the largest market share, which is shown in their higher than market average capacity to benefit financially from their online operations. They also have a rich history of exploiting consumer data (see [Appendix A](#)) – this also puts them in the position of having higher than average ‘agency’ in the consumer-technology-retailer dynamic. As the market’s first mover, Tesco were able to create new value for customers.
- Ocado joined the market with the most innovative proposition and have established themselves as market leaders in terms of high-tech logistical expertise and customer satisfaction. This is reflected in their higher than market average capacity to make use of technology, and value proposition. The cost of developing their technologically driven hub-and-spoke model has however been substantial. Ocado did not post a profit until 2014, when they brokered the deal with Morrisons. Ocado are showing strong potential as a technology firm but have shown little potential to profit from the grocery business.

Table 5.6: Example of an application of the digital transformation model to the UK's online grocery market; late-mover Morrisons; first-mover Tesco and pureplay entrant Ocado

Dimension	Capacity to enact dimension			
	Market-specific	Morrisons	Ocado	Tesco
<i>Use of technology</i>	High	Medium	High	Medium-high
<i>Changes in value creation</i>	Medium – high among specialist retailers	Medium	High	High
<i>Distribution of agency</i>	Medium	Low	Medium	Medium-High
<i>Structural changes</i>	High	Medium	N/A	Medium
<i>Financial aspects</i>	Low	Low	Low-Medium	Medium

The quantitative evidence of the success of Morrisons' digital transformation are addressed in [Chapter 6](#). The final aspect of the outcomes of their digital transformation considered here is Morrisons' perception of consumers in the online era.

Perception of the consumer in the online era

The perception of consumers among Morrisons' personnel was consistent with previous studies with respect to consumers' dislike of substitutions and hesitancy purchasing fresh produce online. Other perceptions were less clear cut. [Table 5.7](#) shows the dominant voices regarding the key dimensions of consumer behaviour as perceived by the academe at large, and by Morrisons' interview respondents.

Table 5.7: Summary of dimensions of (online) consumer behaviour in literature and perceptions of consumer behaviour from Morrisons interview respondents

Dimension	In literature	Morrisons' perception
<i>Product range</i>	<ul style="list-style-type: none"> • Consumers want more breadth, but fewer SKUs • brand loyalty is higher online 	<ul style="list-style-type: none"> • Consumers are increasingly disloyal • Consumers want choice and a broad range of products
<i>Devices</i>	<ul style="list-style-type: none"> • Desktop/laptop > in-store > mobile (Maity and Dass, 2014) • m-shoppers tend to opt for known/branded goods because of screen size / low' media richness' Wang) • m-shoppers increase in value over time (Wang, 2015) • m-shoppers spend more than they used to in-store (Wang, 2015) • Multi-channel shoppers (in some product categories) spend more than single channel shoppers (Ansari et al, 2005; Kushwara, 2013) • Search bar preferred method of site navigation (Anesbury et al, 2016) 	<ul style="list-style-type: none"> • Consumers 'do everything' online • Customers prefer to shop for fresh produce offline • Consumers keep each other informed via social media
<i>Price-sensitivity</i>	<ul style="list-style-type: none"> • Opinions are split about price-sensitivity online 	<ul style="list-style-type: none"> • Customers are price sensitive and price savvy
<i>Location</i>	<ul style="list-style-type: none"> • Distance from supermarket affects propensity to shop online (Huang, 2012; Briesch et al, 2009) • Mobile technologies facilitate personalised, 'micro-geographies of consumption' (Crewe and Lowe, 1995; Ritzer) • Consumers enjoy shopping in relaxed home environment (Michaud Trevinal, 2014) • Consumers like that they can multi-task with home-based online shopping • Consumers rarely have a set time or place to shop with online shopping (Robinson, 2007) 	<ul style="list-style-type: none"> • Lost a few families, picked up sing-person households as the geographic reach of Morrisons online has expanded
<i>Gender</i>	<ul style="list-style-type: none"> • Males are shopping more, but females still predominate 	<ul style="list-style-type: none"> • Shop is very disciplined online without 'pester power' • Demographics of shoppers has changed with new geographic reach - fewer families

<i>Time poverty</i>	<ul style="list-style-type: none"> • Opinions split as to whether modern consumer is time-poor 	<ul style="list-style-type: none"> • Customers are time-poor
<i>Trust</i>	<ul style="list-style-type: none"> • Consumers prefer to shop fresh offline • Consumers dislike substitutions 	<ul style="list-style-type: none"> • Customers hate substitutions • Some customers fear missing out on deals if not in-store • Marketing fresh to customers online presents a challenge
<i>Adoption and accessibility</i>	<ul style="list-style-type: none"> • offline interaction with brand and online word-of-mouth recommendations most likely to attract consumers to online offering (Rafiq, 2005) • double jeopardy effect in force in online - those with lower market share suffer from lower brand loyalty (Danaher et al, 2003) • Loyalty to a single retailer is lower online (Dawes and Nenycz-Thiel, 2014) • moving to online shopping requires significant shift in behaviour, so is a slow process (Hansen, 2014) • shopping online does not usually entail discontinuation of shopping offline (Hand and Rettie, 2008) • Adoption does not imply continuance (Hsu, 2006) • Online shopping perpetuates a 'digital divide', eroding the skills off offline shopping for some (Warschauer, 2003; Vass, 1996) • Having to develop new skills to shop online shifts shopping into 'discursive consciousness'. Shopping is (at least temporarily) no longer an automatic event. • Whether conscious of it, consumers are always engaging in cognitive behaviours when shopping (Simonson, 2005; Janiszewski and Osselaer, 2005) • Consumers do not engage in cognitive behaviours most of the time, but respond to environmental cues and draw upon learnt skills (Dijkterhuis et al, 2005; Schütz, 1967) 	<ul style="list-style-type: none"> • Modern consumers use new technologies, e.g. contactless payment adeptly • Consumers keep each other informed via social media • Consumers like to talk to retailer through chat function • Online can't replace experiential element / social interaction

5.3.2 Focus groups – consumer perception of the outcomes of digital transformation

This section analyses the outcomes of the digital transformation of the UK's grocery market (and Morrisons in particular) for consumers. Focus group respondents used highly emotive language when reflecting on their response to online retailing. [Figure 5.2](#) shows emotive terms and their sentiment, as used by the London group. The more impassioned and emotive responses emerged in response to the areas of the online process that involved interaction with other people.

Figure 5.2: Emotive language use among focus group respondents¹



¹ Size proportional to frequency, see [Appendix G, Table G.2](#) for frequency table.

Points of emphatic approval and annoyance were expressed when describing interaction with drivers, with the customer service line and their relationship with the physical product. The freshness and condition of products was a particular point of contention:

You can't see it before you buy, sometimes when I do my top-up, I do like to go into the supermarket and pick the fruit. Like bananas, I can't bare it, when you get bananas and they're already black and bruised. (FG3)

Others expressed the importance of replicating the care they would take, whilst another appreciated the care and personal touch taken (FG4, FG5).

Customer service was readily attributed to the attitude of drivers, whilst a London respondent became animated when describing service perceived to be above and beyond expectations:

I had a delivery last week, I had tonsillitis, I came to the door in my pyjamas and the bloke went, ' ooh dear, come on kiddies lets go in the other room for mummy and let's take the shopping in and where would you like it, is this close enough to the cupboards for you?' , he was really, really nice and then when he left he said, ' I hope you feel better soon' ...he obviously loved his job, because he was very smiley. (FG6)

The emotional response to using the website itself was muted. Where it was expressed, it was usually in an aspirational sense – wanting the site to provide more inspiration to aid in meal-planning and make the task more exciting (FG7, FG8, FG9). The multi-dimensional nature of this response among respondents is shown with respect to Shove and Meier et al's dimensions of practice in [Tables 5.8](#) and [5.9](#). Specifically, the skill of planning meals, remaining engaged and saving time are explored from two perspectives. They show how two customers leverage the 'favourites' feature of online grocery

shopping to achieve their goals and how concurrent practices interplay with the stated primary objective.

Table 5.8: Four dimensions of practice for focus group respondent using ‘favourites’ I

Goal(s): minimising time spent on menial tasks	
<i>Quote</i>	I use online shopping because it’s such a big shop to do, I just get bored and I just...it’s like a template...tweak it. (FG10)
<i>Resources</i>	Favourites basket on online platform
<i>Meanings</i>	Shared use of ‘template’ also ‘favourites’ among other users to indicate a basket that is prepopulated from previous orders. Shared sense that grocery shopping is boring and time on it should be minimised.
<i>Competencies</i>	Skill in utilising enabling features of online shopping to reduce time spent doing perceived menial task.
<i>Geo-temporalities</i>	Time saving element of shopping form favourites and not having to travel to supermarket are key to this practice.

Table 5.9: Four dimensions of practice for focus group respondent using ‘favourites’ II

Goal(s): Provisioning for home, meal planning, time-saving (over money saving)	
<i>Quote</i>	...meal plan, work out what we’re gonna have for tea the next week and then devise a shopping list form that. It just got to a point where you can literally just put it in... I don’t even look at the offers really online very often... (FG11)
<i>Resources</i>	Favourites basket on online platform
<i>Meanings</i>	Shared meaning of ‘favourites’ basket, shared meaning of putting items in to a virtual shopping basket.
<i>Competencies</i>	Skill in planning and using online technology to realise that vision. Skill in avoiding offers to optimise speed.
<i>Geo-temporalities</i>	Time saving element of shopping form favourites and not having to travel to supermarket are key to this practice. Meal planning may require checking cupboards, which are also at hand in online shopping.

A lack of emotion when using the site may have implications for maintaining engagement and may make consumers fickle and more disloyal. Despite this, the perceived effort of transferring to a new supplier was not un-noted by the participants.

[Table 5.10](#) shows how the perception of time and effort associated with changing supplier can be encapsulated within Shove (2016) and Meier et al's (2017) dimensions of practice.

Table 5.10: Four dimensions of practice for focus group respondent loyal due to effort of setting up 'favourites' with a new retailer

Goal(s)	
<i>Quote</i>	It's that first shop takes time... just gonna take me ages. (FG12)
<i>Resources</i>	Favourites basket on online platform
<i>Meanings</i>	Shared meaning that favourites /established orders save time in online shopping and that this is desirable.
<i>Competencies</i>	Skill in using favourites basket and minimising time spent on shopping task.
<i>Geo-temporalities</i>	Time-saving element of shopping from favourites results in staying loyal to a retailer. Not needing to travel to the supermarket is also key to this time-saving practice.

Interestingly, consumers in the London group in particular saw their loyalty as a transactional good. Referring to being rewarded. Both the London and Leeds groups expressed an expectation of being valued as a loyal consumer and suggested a preference for rewards that showed a level of emotional intelligence. One Leeds participant expressed dismay at the perceived treatment of new customers over existing (FG13). Another felt impressed by the service offered by competitor Ocado (FG14). Notable was the difference in language and terminology used by the Leeds and London groups. [Table 5.11](#) shows the industry specific terminology used by group mentions (without being provocation from the focus group moderator), which gives an indication of the extent to which 'industry' terms have permeated everyday language. In the focus

groups observed, the London participants were much more likely to use industry recognised terms / those used by retailers.

Table 5.11: Industry vocabulary that has entered every day speech

	Leeds	London
Top-up shop		✓
Click and collect		✓
Eat me, keep me / eat now, eat later		✓
Delivery slot	✓	✓
Delivery pass		✓
App		✓
One-click (Amazon)		✓
Free-from / gluten-free	✓	✓
Favourites	✓	✓
Shelf-life	✓	✓
Online / in-store	✓	
Substitutions	✓	

The Leeds group used less recognised terms but displayed higher levels of understanding and reflexivity about the challenges and compromises involved in providing an online delivery service. One participant remarked:

I think sometimes when you shop online you expect that some of those things you're going to have to forego, because you are shopping online and personally, I think that, you know, that everything's going to be standard. (FG15)

another reflected on the trade-offs emerging by expanding product range online, expressing that:

I wouldn't want that to be at the demise of anything else though ...the demise of delivery slots... (FG16)

In contrast, the London group were more optimistic about the capacity of the retailer to deliver more range without compromising existing services and did not reflect on such trade-offs until prompted. Several participants expressed a desire for shorter delivery slots, but when probed to consider whether they would prefer more delivery slots or shorter delivery slots, their priorities emerged more clearly:

I wouldn't want the quantity of timeslots sacrificed for just the half an hour time slot... I would want that choice, if you're not in until 9 o'clock at night be great to have that delivery then as opposed to everything stops at 6... (FG17)

This was echoed by other participants:

I don't think an hour's unreasonable...and to be honest they're usually early. (FG18)

This suggested that the London group had higher expectations of retailers, but also highlights the importance of context for identifying the priorities and thoughts of consumers. The perception of exceptional service from other e-tailers may have prompted high expectations, with several respondents expecting the full range of products to be online one who described her surprise at the level of service received by Amazon, a brand with which several participants expressed a fondness:

My son ordered something on a Saturday afternoon and said it was going to be here tomorrow. And I had this argument with him saying ‘look, don’t be so silly, it won’t get here on a Sunday’, I was like, ‘no one delivers on a Sunday’, and he was right. It came on a Sunday and I was absolutely shocked, and I was arguing with an 11 year old...I felt a right idiot. (FG19)

One big theme that emerged, ‘image/perception’, related to the identity of an online retailer and indeed the inferred self-identity of consumers. One participant expressed an emotional connection and resonance with a retailer considered to have a fresh and up-market image, claiming to ‘feel good’ when using their site. This desire for modernity alongside value seemingly reflects the importance of maintaining an identity of relative affluence, whilst also achieving good value, akin to the skill exhibited by housewives doing self-service shopping for the first time in the 1950s and 60s. This maintenance of an identity as a purveyor of quality, counterbalanced with the practice of showing thrift resulted in high expectations of the retailer. An example of this in terms of the dimensions of practice is shown in [Table 5.12](#).

Table 5.12: Four dimensions of practice for focus group respondent with high expectations of retailers

Goal(s): Getting the best value, maintaining ‘middle-class’ identity	
<i>Quote</i>	Doesn’t look very upmarket...still quite old-fashioned...maybe they’re saying you know, there products are more value for money...too many things look more like a value range as opposed to having a value range... yes they are very competitive on price...but that doesn’t mean their website has to look dated.
<i>Resources</i>	Web brand identity, offers on products
<i>Meanings</i>	Shared meaning that certain colours and fonts exhibit quality
<i>Competencies</i>	Thrift, good-taste
<i>Geo-temporalities</i>	Reputational impacts of delivery van arriving at house

In summary, the focus group observations revealed how consumers are interacting with online shopping and online grocery shopping in particular. A number of themes emerged consistently across the three focus groups, although the responses to these were not always uniform. These emergent themes and a summary of the sometimes conflicting findings are summarised in [Table 5.13](#). A summary of key quotes and the related thematic codes emerging from the focus group observations can be found in [Appendix G](#).

Table 5.13: Summary of key emergent themes for consumers engaging with online grocery shopping

Emergent theme	Description
<i>Expectation</i>	<p>Consumer expectations emerged as a core component of engagement with online grocery shopping</p> <ul style="list-style-type: none"> many respondents expected a full range of products online and had high expectations drawn from experiences with other online sectors, notably Amazon prime. some respondents (particularly in the Leeds group) anticipated having to compromise when purchasing groceries online. <p>In terms of 'concurrent practices' respondents' expectations of online grocery shopping were seen to interact with the practice of maintaining an identity of 'quality' alongside the skill of shopping intelligently to get the best deals.</p>
<i>Freshness and care</i>	<p>The quality and freshness of products was mentioned by nearly all respondents across the focus groups. Most respondents were female and the desire to exhibit 'womanly skill' in selecting the best products was mentioned. There was a perception that the online shopper would not have the skill or motivation to choose the best products. This was cited as a reason for some not purchasing the full range of products online.</p>
<i>Service and being valued</i>	<p>Despite the 'asocial' nature of online grocery shopping, the quality of the interactions with the retailer were of paramount importance to most respondents. Emotive responses to interactions with delivery drivers were particularly highlighted and several reported that poor service would be a key driver for moving to a new service/channel.</p>
<i>Boredom</i>	<p>The repetitiveness and low responsivity of the web site in online grocery shopping struck many respondents. For some, being able to shop very quickly</p>

	made this tolerable, whilst others had higher expectations of being inspired, assisted and entertained online.
<i>New practices</i>	<p>Online shopping has facilitated a number of ‘domain specific’ behaviours, two most commonly mentioned:</p> <ul style="list-style-type: none"> • respondents reported using the shopping basket as a shopping list, edited throughout the week before being transacted / transacted for the final time • respondents reported investing time in the first shop to set up a favourites basket and then use this to populate / structure future orders.

Sections 5.1 to 5.3 used a ‘top-down, bottom-up’ thematic analysis approach to understand the drivers of (and barriers to) digital transformation of the UK’s grocery market; the strategic changes associated with this transformation; and the outcomes of the transformation from both retailer/industry and consumer perspectives.

The next section triangulates these findings and shows how, alongside findings from previous literature, they were used to generate hypotheses to address the fourth research question, namely:

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

5.4 Discussion of qualitative findings and development of hypotheses for quantitative analysis

This chapter has scrutinised the findings of interviews with Morrisons’ executives and senior staff; a competitor and retail analyst regarding the drivers, strategic shifts and outcomes of the digital transformation of Morrisons as it became a late entrant to the UK’s online grocery market.

5.4.1 Drivers of (and barriers to) digital transformation of the UK's grocery market

With respect to **RQ1**, the drivers of (and barriers to) entering the online grocery market as a retailer and as a consumer were considered.

It was shown that that Morrisons' entry to the online grocery market was defensive - driven primarily by necessity and consumer-demand. Morrisons was losing customers to those retailers who were offering online services. A summary of the key points of agreement and disagreement with existing literature is shown in [Table 5.14](#).

Table 5.14: Codebook and findings for first order code: (barriers and) drivers – retailer / industry (reproduction of Table 5.2)

First order code	Emergent code	Key findings	Comparison with prev. lit.	
Barriers	<i>Retailer perspective</i>	Difficult to make online profitable Market coverage already close to 100% in UK Market cannibalisation occurring	Agrees	Lack of financial incentives, e.g. Fuentelsaz et al (2015) Lower market share and cannibalisation, e.g. Mascarenhas (1992)
			Disagrees	Cost saving, e.g. Bharadwaj et al (2013); Loebbecke (2015)
	<i>Perception of consumer</i>	Opportunity cost of shopping online and not getting exposure to best deals in-store Online lacks experiential richness and sociality, tangible goods Inappropriate substitutions annoy customers	Agrees	Dislike substitutions, e.g. Hand et al (2009) Don't want to shop for fresh produce online, e.g. Kestenbaum (2017); Marino (2015)
			Disagrees	
Drivers	<i>Retailer perspective</i>	Defensive - to regain / protect consumer-base To attract a new demographic? Acceptance of longevity of online market Multi-channel customers higher value?	Agrees	No financial incentives, e.g. Fuentelsaz et al (2015) Multi-channel spend more, e.g. Ansari et al (2005)
			Disagrees	Spend depends on product category, e.g. Kushwaha and Shankar (2013)
	<i>Perception of consumer</i>	Expect online ordering option Expect the full range of products to be available online Price-sensitive, price-savvy, online shop is disciplined Time-poor, value speed and convenience	Agrees	Time-poor, e.g. Wajcman (2014) Complete shop in seconds, e.g. Robinson (2007)
			Disagrees	More time and money spent online, e.g. Michaud Trevinal (2014); Degaratu (2000); Wang et al (2015)

For the consumer, the decision to engage with online grocery shopping revolved around nine consistently reported themes (see [Table 5.15](#)). Value, quality and convenience were drivers of shopping online, as was the ease with which the online store can be searched. Disincentives included the inability exhibit the ‘woman’s skill’ of perishable food selection. Some respondents found the restrictions of delivery slots a further disincentive and most found the process of online shopping fairly boring. For most consumers, the importance of feeling valued and of good customer service were important online as they were for offline shopping. Price was important to customers, but not at the expense of quality. Many referred to this balance of competitive pricing and good quality as ‘value’, which was unanimously important to consumers.

Table 5.15: Codebook and findings for first order code: (barriers and) drivers – consumer (reproduction of Table 5.3)

Emergent themes	Leeds	London
<i>Value</i>	Cost, offer, offers first, promotions first, best value	Value for money, Good price, competitive, offers
<i>Quality</i>	Date/out of date, quality, poor quality, up their game, streets ahead	Value range (poor quality), natural ingredients, dated, modern, Best of British, high meat content
<i>Convenience</i>	Easy, favourites, don’t have a list	Hour delivery, app, Click and Collect, Favourites
<i>Service</i>	Missing, smashed, substitutes, replacements, reliable, no-quibble, no questions asked, happy	Customer service, polite, friendly
<i>Rewards</i>	Vouchers, redeem	Incentives
<i>Boredom/routine</i>	Not very exciting	Boring
<i>Image / perception</i>	Modernising, lost their way	Colours, posh, posher, old-fashioned

<i>Range</i>	Choice, alternatives, range, non-standard, every day, get in-store but not online, fresh-baked bread	In store but not online, bakery, Variety
<i>Site navigation</i>	Search	Search, click on offers

Table 5.16: First and second order ‘top-down’ interview coding schema; and emergent ‘bottom-up’ codes

‘Top-down’ predetermined codes		‘Bottom-up’ emergent codes
<i>First order codes</i>	<i>Second order codes</i>	<i>Third order codes</i>
<i>Barriers (and drivers)</i>	Motives / incentives for consumer	<i>High expectations</i> <i>Time poverty</i> <i>Convenience</i>
	Risks/disincentives for consumer	<i>Inconvenient</i> <i>Social needs</i> <i>Experiential needs</i>
	Motives / incentives for retailer	<i>Retaining customers</i>
	Risks/disincentives for retailer	<i>Disloyalty</i> <i>Reluctance to move online, driven by previous CEO</i> <i>Difficult to make profit online</i>
<i>Strategic change</i>	Financial aspects	<i>Failed ventures / strategic fallouts</i> <i>Late to market</i> <i>Partnerships</i> <i>Competition</i>
	Use of technology	<i>Logistics, service model</i> <i>Lost technologies</i> <i>Morrisons team dynamics</i> <i>Partnerships</i> <i>Technological capabilities</i>

Brand identity
Consumer practices, distribution of agency
Technological capabilities; Morrisons team dynamics
Customer value proposition

Value creation

Brand identity
Customer value proposition
Experiential
Consumer practices
Logistics, service model
Technological capabilities

Structural change

Competition
Failed ventures / strategic fallouts
Late to market
Partnerships
Logistics, service model
Lost technologies
Morrisons team dynamics
Technological capabilities

Distribution of agency

Consumer changing practices
Power dynamics between consumer and retailer

<i>Outcomes (as perceived by retailers)</i>	Retailer performance	<i>Basket stability</i> <i>Loyalty</i> <i>Power dynamics</i> <i>Price-sensitivity</i> <i>Profitability, loyalty</i> <i>Competitors</i> <i>Experiential, brand identity</i> <i>Logistics, service model</i> <i>Non-traditional entrants</i> <i>Online growth, speed of growth</i> <i>Power dynamics, consumer practices</i> <i>Profitability</i> <i>Technical capabilities, digital marketing</i> <i>Technological capabilities</i> <i>Value proposition</i>
	Consumer behaviour	<i>Demographic changes</i> <i>Disloyalty, power dynamics</i> <i>Basket stability</i> <i>Loyalty</i> <i>Power dynamics</i> <i>Price-sensitivity</i> <i>Profitability, loyalty</i> <i>Expectations</i> <i>Experiential</i> <i>Online growth, speed of growth</i>
	Retailer-consumer relationship	<i>Expectations</i> <i>Experiential</i> <i>Online growth, speed of growth</i> <i>Engagement with customers</i>

5.4.2 Strategic shifts and outcomes of the digital transformation of the UK's grocery market

With respect to RQ2 and RQ3, it was shown that Morrisons' digital transformation provides clear examples of Matt et al's four dimensions of digital transformation and the

capacity to succeed in each of these areas was explored. Some of these capacities were shown to be Morrisons' specific – relating to Morrisons' late market entry and unique relationship with Ocado; and others reflected the unique challenges of the UK's online grocery market, such as the demands of delivering perishable foods to individual households. The acute awareness of web enabled socio-technical systems as 'social machines' afforded by the web science lens adopted in this thesis also facilitated the extension of Matt et al's dimensions of digital transformation. A fifth dimension 'distribution of agency' was proposed to capture the shifts in retailer-machine-consumer relations and the balance of power afforded by this dynamic. It was suggested that Morrisons' skillset as a traditional retailer are constrained by interfacing with web-technologies and the unknown logistical challenge of delivering to each and every customer. The power balance has swung in favour of the consumer – who is able to leverage online technologies to readily compare products between retailers and to negate the effort of travelling to the supermarket, processing products themselves and transporting them home. It was proposed that retailers' ability to communicate with and co-construct services with customers will play a big role in their longevity in online grocery shopping. This will involve leveraging data effectively at the points of interaction online between customer and retailer. Morrisons' have made some bold steps to 'recapture' agency – the deal with Ocado has given them access to logistical specialists; and their deal with Amazon provides a 'hedge' if and when Amazon's nascent offering beginning to seriously threaten the UK's online grocery market.

5.4.3 Derivation of hypothesis to ascertain whether there have been shifts in consumer practices in the online grocery shopping era

With respect to RQ4, interviews and focus groups were also analysed to provide insight into the perceptions of executives and customers about habits, practices and preferences in online shopping. Three recurring themes were price-sensitivity, time-saving and reticence in buying perishable products online. Drawing upon Shove and Meier et al's dimensions of practice we see that consumer practices are not isolated from context, but often occur concurrently. As Shove suggests:

understanding how peaks and troughs of [energy] demand come to be as they are depends on thinking not about one practice at a time, but about how complexes of practice relate to each other and how sequences and rhythms are formed. ([Shove, 2016](#), p. 165)

Perhaps those users who increase their time per shop show evidence of other concurrent practices. These practices may relate to socio-demographic characteristics or may be more evident in combinations of subtle shopping practices. This confluence of practices is also kept in mind for the interpretation of any seemingly conflicting findings that arise – such as the perception of time-saving with no empirical evidence to support this.

Table 5.17: Triangulation summary of dimensions of (online) consumer behaviour

	Dimension	In literature	Retailer perspective	Consumer perspective	Hypothesis
Demographics and characteristics	<i>Gender and household</i>	<ul style="list-style-type: none"> Companionate marriage and non-traditional households contributing to more males doing the grocery shopping Ability to shop 'anywhere' could be contributing to a shift in gender roles Proportion of females among online grocery shoppers ranges from around a third to around three quarters among different studies Families with children are the most likely to shop for groceries online; the poorest and elderly are least likely 	<ul style="list-style-type: none"> Shop is very disciplined online without pester power Demographics of shoppers has changed with new geographic reach - fewer families 	<ul style="list-style-type: none"> Shoppers disappointed to receive poor quality fresh produce - one remarked on it being a woman's thing to select quality produce. Women still primary shoppers, although men increasingly so. 	Hypothesis 2
	<i>Age</i>	<ul style="list-style-type: none"> Generation X (those aged around 35-54) are the most likely to shop online 	<ul style="list-style-type: none"> Since online inception have lost a few families and picked up single-professionals 		

		<ul style="list-style-type: none"> • Conflicting findings relating to Millennials and younger users • Some evidence that the demographic of online shoppers has increased over time (that Millennials were the ‘early adopters’) 			
	<i>Location</i>	<ul style="list-style-type: none"> • Distance from supermarket affects propensity to shop online • Mobile technologies facilitate personalised, ‘micro-geographies of consumption’ • Consumers enjoy shopping in relaxed home environment • Consumers like that they can multi-task with home-based online shopping • Consumers rarely have a set time or place to shop with online shopping 	<ul style="list-style-type: none"> • Customers use the shopping basket as a shopping list. • Customers may be likely to edit a basket multiple times, in between other home-based practices. • Not being in-store allows consumers to show more self-restraint in avoiding confectionary. 	<ul style="list-style-type: none"> • Easier to avoid temptation when shopping online • Use ‘favourites’ to structure shop • Use the basket as an on-going shopping list 	
Practices and preferences	<i>Price-sensitivity</i>	Consumers spend more online: <ul style="list-style-type: none"> • M-shoppers increase in value over time 	Customers are price sensitive and price savvy	Customers look for good value and offers, but don’t think the interface should look ‘budget’	Hypothesis 3

	<ul style="list-style-type: none">• M-shoppers spend more than they used to in-store• Individualistic spending - increased propensity to treat• Purchases not on shopping list – justified as taking advantage of offers <p>Consumers spend less online:</p> <ul style="list-style-type: none">• Online and household shopping more disciplined and thrifty• Shop less regularly, spend less online		For some users, speed and convenience is more important than engaging with offers.
<i>Time-poverty</i>	<p>Evidence to support increased time poverty:</p> <ul style="list-style-type: none">• ‘Twenty-first century families are’ time-poor’• Consumers do whole shop in minutes, using ‘favourites’• Consumers who prefer to shop online are driven by convenience, with low requirement for variety, and	Customers are time-poor	Time saving is commonly reported - busy working, doing house related tasks, don’t have time to visit supermarket.
			Hypothesis 4

lower demand for receiving products instantly

Evidence contesting increased time poverty:

- Propensity to multi-task extends online shopping time
- Online shoppers spend a matter of seconds selecting products online, although this was similar to offline
- No evidence to support time being a factor of convenience online

Trust and basket composition

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Consumers are worried about purchasing perishable products online • Consumers are worried about receiving inappropriate substitutions when shopping online • More brands, but lower SKUs = higher spend • Brand loyalty (including own-brand) is higher online | <ul style="list-style-type: none"> • Consumers want choice and a broad range of products (I3.7, I3, I1, I3) • Customers hate substitutions (I1, I3.) • Some customers fear missing out on deals if not in-store (I1.2) • Marketing fresh to customers online presents a challenge (I3.) | <ul style="list-style-type: none"> • Most consumers expect full range of products online. • Consumers expect to be entertained / offered new options, products and recipe ideas online. • Consumers prefer to pick long dated perishable products and select their own fruit and meat. May indicate lower spend on these items online. • Some consumers prefer to shop for fresh offline and are disappointed to receive |
|---|---|--|

Hypothesis 5,
Hypothesis 6

				<p>damaged or poor-quality fresh items.</p> <ul style="list-style-type: none"> • Customers hate inappropriate substitutions. • Driver attitude is important - especially since it is someone you are letting into your home.
<i>Devices</i>	<ul style="list-style-type: none"> • desktop/laptop > in-store > mobile • m-shoppers tend to opt for known/branded goods because of screen size / low 'media richness' • m-shoppers increase in value over time • m-shoppers spend more than they used to in-store • multi-channel shoppers (in some product categories) spend more than single channel shoppers • search bar preferred method of site navigation 	<ul style="list-style-type: none"> • Online shop is very disciplined • Modern consumers use new technologies, e.g. contactless payment adeptly 	<ul style="list-style-type: none"> • Prefer to use search bar for navigation or will click on offers. • Likely to base most of order on favourites basket / previous order. • Tend to follow a routine - may thus be blind to changes on homepage. • Like offers to be shown as first options when navigating to a page. 	Hypothesis 7

*Adoption, loyalty
and accessibility*

- offline interaction with brand and online word-of-mouth recommendations most likely to attract consumers to online offering
- double jeopardy effect in force in online - those with lower market share suffer from lower brand loyalty
- Loyalty to a single retailer is lower online
- moving to online shopping requires significant shift in behaviour, so is a slow process
- shopping online does not usually entail discontinuation of shopping offline
- Adoption does not imply continuance
- Online shopping perpetuates a 'digital divide', eroding the skills off offline shopping for some
- More brands, but lower SKUs = higher spend
- Brand loyalty (including own-brand) is higher online
- Consumers are increasingly disloyal
- Consumers keep each other informed via social media
- Consumers like to talk to retailer through chat function
- Online can't replace experiential element / social interaction
- Consumers find initial effort of setting up online account cumbersome, so tend to remain loyal
- Relationship with drivers and service-line are important to the consumer - good service and feeling valued makes consumers loyal

Hypothesis 8

*Consciousness,
behaviour and
practices of
consumption*

- Having to develop new skills to shop online shifts shopping into 'discursive consciousness'
Shopping is (at least temporarily) no longer an automatic event.
- Whether conscious of it, consumers are always engaging in cognitive behaviours when shopping
- Consumers do not engage in cognitive behaviours most of the time, but respond to environmental cues and draw upon learnt skills

Throughout

To contribute quantitative evidence to RQ3, a hypothesis relating to firm performance of Morrisons' online offering and the company as a whole was proposed. This was posed as the assertion that 'online is going well', a claim made by a senior Morrisons' executive during an interview.

- **Hypothesis 1:** 'Online is going well'

To address RQ4, seven hypotheses were proposed relating to the characteristics and practices of Morrisons' online consumers. The derivation of these from the triangulation of previous studies and the qualitative phase of this thesis is shown in [Table 5.17](#). In summary, the hypotheses relating to RQ4 to be tested in the quantitative phase were as follows:

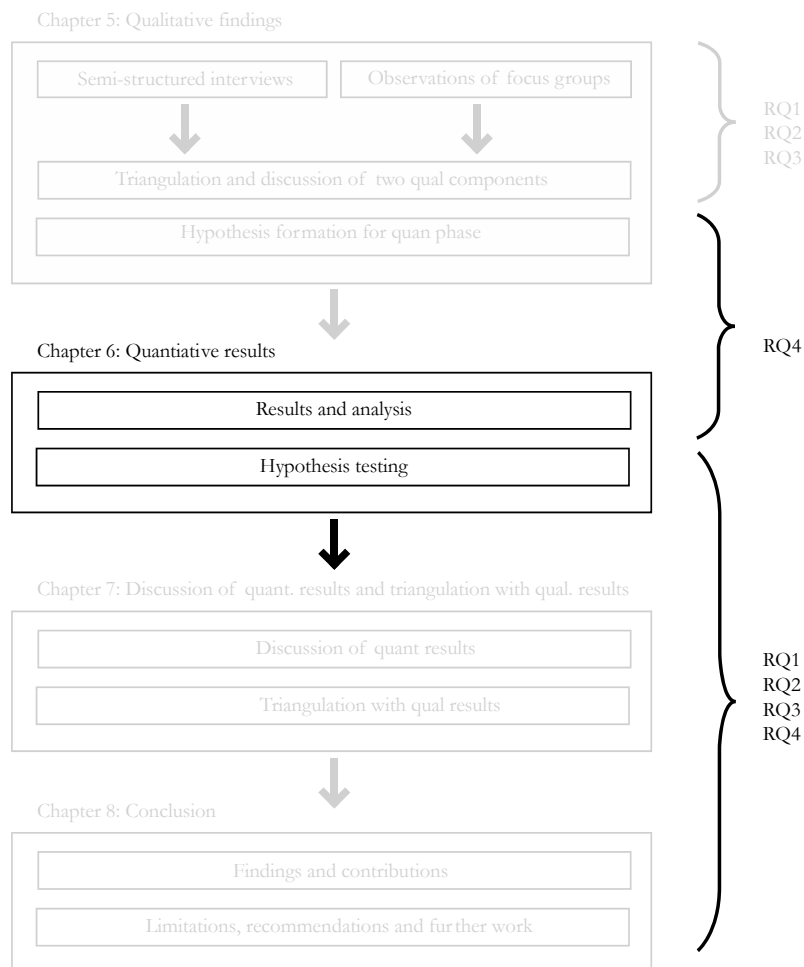
- **Hypothesis 2:** The demographic composition of the online consumer-base is the same as the offline consumer-base
- **Hypothesis 3:** Online consumers are price-sensitive
- **Hypothesis 4:** Online consumers are time-poor
- **Hypothesis 5:** It is difficult to up-sell to / disrupt the grocery basket of online consumers
- **Hypothesis 6:** Consumers shop for the same products online and offline
- **Hypothesis 7:** Screen size proportional to average basket value for online consumers
- **Hypothesis 8:** Online consumers are 'disloyal'

Evidence from the quantitative transaction data and other secondary sources were used to test these hypotheses. The main source of data were the transaction data of Morrisons' consumers, although this was supplemented with national level data from the Office for National Statistics' Living and Food Costs survey and the results of a

YouGov survey. The methodology for doing so was outlined in Chapter 4, the results and analysis of these investigations follow in Chapter 6.

6. Quantitative results

Figure 6.1: Final research design – quantitative phase



6.1 Hypothesis 1: “Online is going well”

In interviews, Morrisons’ executives and directors were pleased with how their online channel was performing, citing profits and increased volumes as evidence of this (Section 5.3.1). This section looks for evidence of these claims in Morrisons’ overall performance since online inception; and in the performance of its online offering in particular. Five financial measures were calculated (see [Table 6.1](#)) to measure Morrisons’ performance throughout its digital transformation to date. The demand and supply effects of their move online were also examined.

Table 6.1: Metrics used to assess how well Morrisons digital transformation and entry to the online grocery market has progressed

Financial metrics	Demand and supply effects
Firm profits since online inception:	Demand-side advantages
<ul style="list-style-type: none"> Operating profit 	Demand-side disadvantages
<ul style="list-style-type: none"> Operating profit margin 	Supply-side advantages
Shareholder value since online inception:	Supply-side disadvantages
<ul style="list-style-type: none"> Economic profit 	
Online change in revenue since online inception	
<ul style="list-style-type: none"> Nominal revenue 	
<ul style="list-style-type: none"> Real (CPI adjusted) revenue 	

6.1.1 Financial performance metrics

None of the UK's major supermarkets publish their online performance separately from their offline performance. Determining how Morrisons' online offering is faring in the market is therefore difficult. This section takes a more holistic approach by considering:

- how **operating profits** and **operating profit margin** have changed since online inception;
- how **shareholder value** has changed since inception; and
- how **online revenue** has changed since inception.

Operating profit was selected as a measure of the effectiveness of Morrisons' management and digital strategy since online inception since it discounts the effects of fixed costs and long-term debt, depreciation, amortization and tax.

Operating profit shows a company's ability to manage its indirect costs...shows how a company is investing in areas it expects will help to improve its brand and business growth through several channels. A company may have a high gross profit margin but a relatively low operating profit margin if its indirect expenses for things like marketing, or capital investment allocations are high. (Beers, 2019)

Formally, operating profit is defined as:

Operating Profit

$$= \text{Operating Revenue} - \text{Cost of Goods Sold} - \text{Operating Expenses} \\ - \text{Depreciation} - \text{Amortization}$$

Following two years of operating losses in 2014 to 2015, David Potts' tenure has seen a return to profit at Morrisons. It posted operating profits of £314m in 2016 and £468m

in 2017, although this was still considerably below the £0.9bn+ per annum enjoyed between 2010 and 2013 ([Table 6.2](#)).

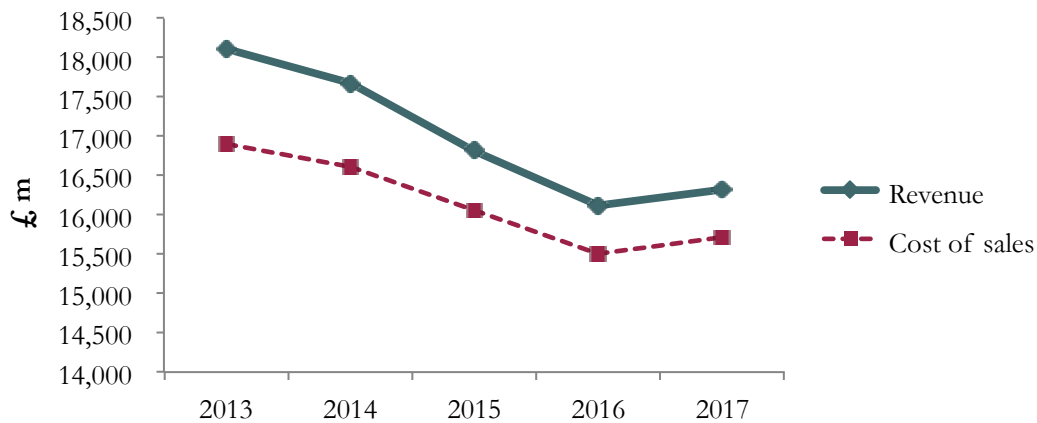
Table 6.2: Operating profit (loss) in £m, 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Morrisons	907	904	973	949	(95)	(696)	314	468
Tesco	2,413	2,504	2,478	2,272	2,191 ¹	467	498	505
Sainsbury's	671	738	789	831	873	720	635	626
Asda	899	805	846	841	994	1,013	1,046	845
Waitrose	231	253	239	261	221	169	138	197
Aldi	-21	19	103	172	271	260	256	211
Lidl	1	0	1	1	1	12	2	1
Co-op	383	389	309	211	186	181	186	182
Ocado	(14)	(2)	1	5	1	14	19	22

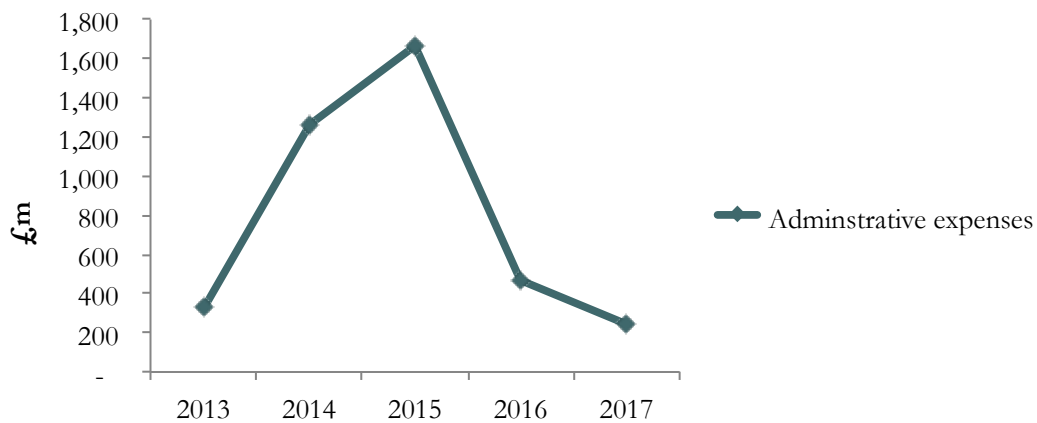
¹ Tesco introduced new non-GAAP measures 2015/16 onwards, 2015 53 weeks, exc. IFRIC 13

Source: Company financial reports - Morrisons ([2019a](#)), Tesco ([2019](#)) Sainsbury's ([2019](#)), Companies' House ([2019a](#)), Waitrose ([2019](#)), Companies' House ([2019b](#)), Co-op ([2019](#)), Ocado ([2019](#))

Since 2014, Sainsbury's, Aldi's and Lidl's operating profits have reduced year-on-year. Tesco's history of operating profits is partially obscured due to a change in accounting measures in 2015. Ocado have fared well in terms of profit since the deal with Morrisons, which bolstered their profits from 2015 onwards. Ocado has made much more profit in its capacity as a 'technology solutions' company than as a grocery retailer – as indicated by their performance up to 2014.

Figure 6.2: Morrisons' annual revenue and cost of sales since 2013

Source: Morrisons financial reports ([2019a](#))

Figure 6.3: Morrisons' annual administrative expenses since 2013

Source: Morrisons financial reports ([2019a](#))

To determine the source of the increasing operating profit, [Figures 6.2](#) and [6.3](#) show three components of operating profit, namely the operating revenue, cost of sales and administrative expenses (part of operating expenses) since 2013. Revenue rose in 2017, bucking the downward trend since 2013. Despite this, the gross profit has fallen every year since 2013. Where Morrisons has made ground in recent years is in dramatically

reducing its administrative costs. In 2017, administrative expenses were the lowest they have been over the period.

To see how much profit Morrisons and its competitors made per £ of sales, the operating profit margin was calculated for each Morrisons' major competitors.

$$\text{Operating profit margin} = \text{operating profit} / \text{sales revenue}$$

[Table 6.3](#) shows that Morrisons' operating profit margin has improved year-on-year since 2015. Most of its competitors have had relatively stable or fluctuating operating profit margins over the same period, whilst discounter Aldi has seen a year-on-year worsening.

Table 6.3: Operating profit (loss) margin 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Morrisons	6%	5%	6%	5%	(1%)	(4%)	2%	3%
Tesco	6%	6%	6%	5%	5%	1% ¹	1%	1%
Sainsbury's	3%	3%	4%	4%	4%	3%	3%	2%
Asda	5%	4%	4%	4%	4%	4%	5%	4%
Waitrose	5%	5%	5%	5%	4%	3%	2%	3%
Aldi	-1%	1%	4%	4%	5%	4%	3%	2%
Lidl	0%	0%	0%	0%	0%	1%	1%	0%
Co-op	5%	5%	4%	3%	3%	3%	3%	3%
Ocado	(4%)	(0%)	0%	1%	0%	1%	0%	2%

¹ Tesco introduced new non-GAAP measures 2015/16 onwards, 2015 53 weeks, exc. IFRIC 13

Source: Company financial reports - Morrisons ([2019a](#)), Tesco ([2019](#)) Sainsbury's ([2019](#)), Companies' House ([2019a](#)), Waitrose ([2019](#)), Companies' House ([2019b](#)), Co-op ([2019](#)), Ocado ([2019](#))

Whilst aiming to increase shareholder value as a strategy is contentious, most agree with the assertion that:

Generating long-term value for shareholders is a good thing. If firms serve customers well and organize employees in ways that allow them to express their talents in service of customers, the company and shareholders will prosper...
(Denning, 2017)

The shareholder measure selected was ‘economic profit’ or ‘economic value added’ (EVA™). Economic profit evaluates a company’s efficiency in terms of how it allocates resources and is given by:

$$\text{Economic profit} = \text{NOPAT} - (\text{Total Assets} - \text{Current Liabilities}) * \text{WACC}$$

Where NOPAT = Net operating profit after tax and WACC = weighted average cost of capital. Since Economic profit can be thought of as “profit from producing goods and services while factoring in the alternative uses of a company’s resources” (Murphy, 2019) it is a good measure of the effectiveness of management decisions.

Morrisons’ economic profit is shown alongside those of ‘Big 4’ competitors Tesco and Sainsbury’s in [Table 6.4](#) (See [Appendix H](#) for the total assets, current liabilities and WACC of each company). Asda are not shown since their after-tax assets and current liabilities are reported as part of the much larger Walmart group.

Table 6.4: Economic profit (loss), £m

	2013	2014	2015	2016	2017
Morrisons	693	(174)	(726)	259	408
Tesco	385	1,350	(5,259)	291	71
Sainsbury's	26	68	(645)	225	125

Source: Company financial reports - Morrisons ([2019a](#)), Tesco ([2019](#)) Sainsbury's ([2019](#)), Companies' House ([2019a](#)), Waitrose ([2019](#)), Companies' House ([2019b](#)), Co-op ([2019](#)), Ocado ([2019](#))

All three firms suffered economic losses in 2015 and have since returned to economic profit. All three were broadly on par in 2016, but whilst Tesco and Sainsbury's saw their economic profit fall significantly in 2017, Morrisons grew by around £150m. This is particularly marked when you consider the relative size of the firms ([Koller et al, 2015](#)). Morrisons has the smallest market capitalisation of the three firms and had the lowest revenue of around £16.3bn compared to Sainsbury's' £26.2bn and Tesco's £55.9bn. If we scale the economic profit by dividing through by revenue this disparity is amplified.

Table 6.5: Value creation per £ of sales (economic profit / revenue)

	2013	2014	2015	2016	2017
Morrisons	38,244	(9,846)	(43,198)	16,065	25,011
Tesco	6,066	21,238	(92,388)	5,402	1,264
Sainsbury's	1,126	2,836	(27,120)	9,569	4,755

See Appendix H for the total assets, current liabilities and WACC of each company. Source: Company financial reports

[Table 6.5](#) shows that the value created per £ of sales at Morrisons in 2017 was five times higher than at Sainsbury's and twenty times higher than at Tesco. Looking at Morrisons'

online revenue since online inception, [Figure 6.4](#) shows that from Q2 2016 onwards, year-on-year monthly nominal online revenue has increased every month.

Figure 6.4: Nominal online revenue relative to previous year (Morrisons.com)

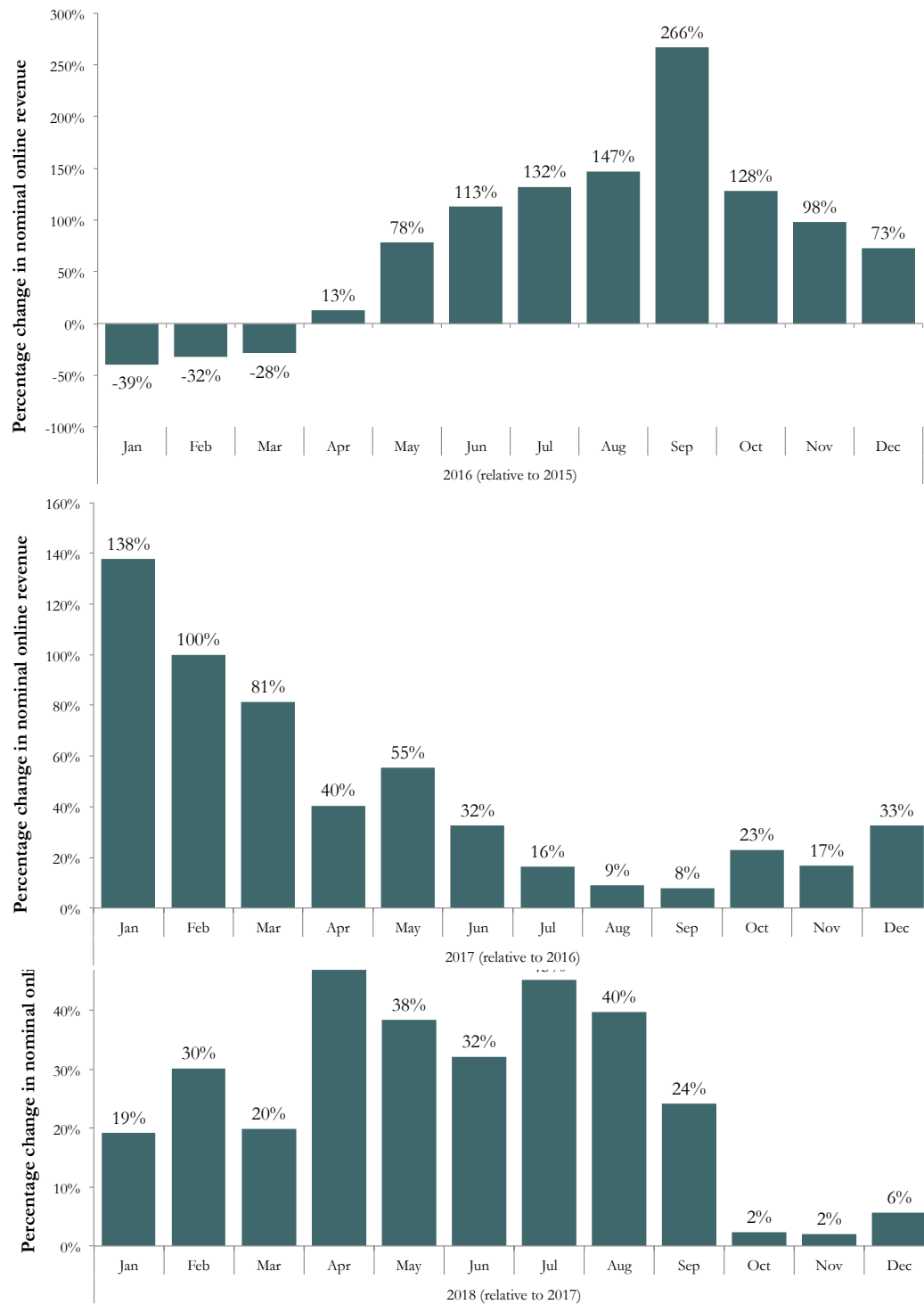
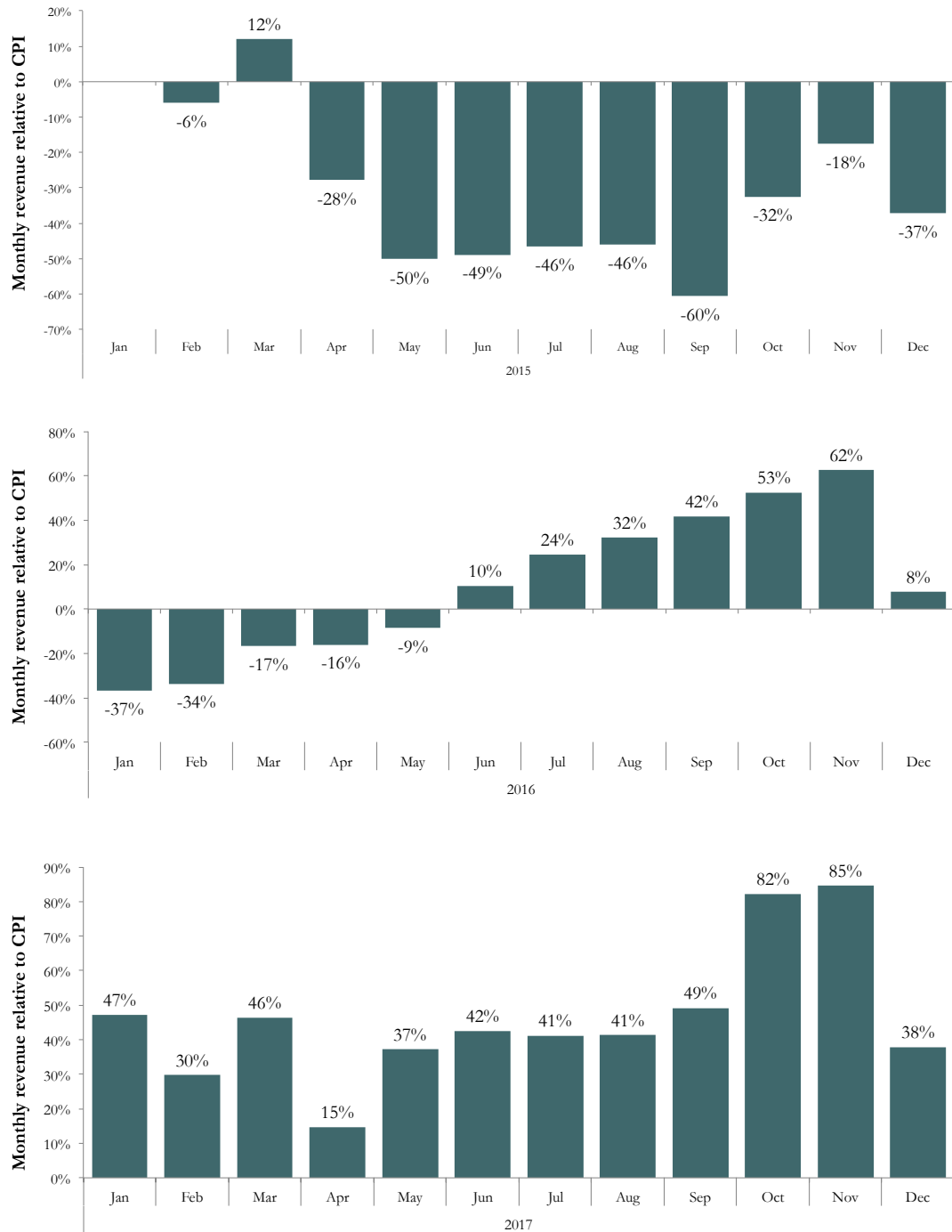
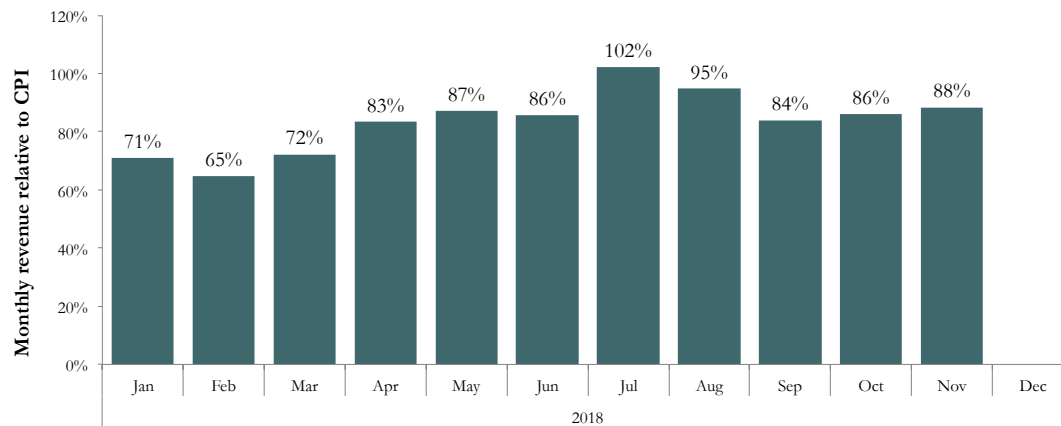


Figure 6.5: Monthly online revenue relative to change in CPI (Morrisons.com)





Source: Morrisons (2019b)

Figure 6.5 shows that the monthly change in revenue relative to the consumer prices index (CPI) was negative for most of 2015 but that revenue has outpaced inflation since June 2016.

6.1.2 Digital transformation metrics

Another way to assess the success of adding an internet sales channel is to consider how demand and supply side (dis)advantages affect the firm (Geyskens et al, 2002). This is shown for Morrisons' entry to the online grocery market in Table 6.6.

Table 6.6: Demand and supply (dis)advantages

	Description	Morrisons' entry
<i>Demand-side advantages</i>	Charge higher price / generate higher demand: market expansion, brand switching, relationship deepening (upselling), price rises	Net positive potential Morrisons has the capacity to charge higher prices online, to expand to areas where there is no current store presence, to (re)gain customers from competitors and to upsell to existing customers.
<i>Supply-side advantages</i>	Reduced costs: cut out intermediaries, centralised marketing, reduced human error	Net negative potential Morrisons' has some capacity to centralise its marketing via their website and targeted advertising; and reduce stock ordering errors through the warehouse hub-and-spoke automated model; but this is vastly outweighed by the cost of distributing perishable foods to individual addresses.

<i>Demand-side disadvantages</i>	Reduced revenue	Net positive potential By increasing Morrisons' geographical reach, revenue is likely to increase through the addition of an online channel. There is however potential for drag in the form of 'market cannibalisation', where Morrisons customers opt to use online instead of stores with potential for increased costs.
<i>Supply-side disadvantages</i>	Increased costs	Net negative potential Servicing online consumers is expensive, particularly in a perishable goods market. By partnering with Ocado, Morrisons has mitigated some of these risks as Ocado are established as market-leading in terms of logistics and customer satisfaction.

Summary of results

Hypothesis 1: "Online is going well"

- Initial financial indicators suggest that Morrisons' firm performance since online inception has been strong. Despite this, operating profits and firm value remain lower than in 2013, prior to the loss-making years of 2014 and 2015.
- Further improvements in operating profit will require increasing revenue whilst maintaining the recent gains made from reduced administrative expenses.
- Morrisons' capacity to sustain improvements reside in their ability to manage the relationship with Ocado efficiently; and in expanding the consumer base or making online customers more valuable than offline customers to mitigate the risk of market cannibalisation. This will be challenging given the high price-competition still dominating the UK's grocery market.

6.2 Hypothesis 2: The demographic composition of the online consumer-base is the same as the offline consumer-base

6.2.1 How do the demographics of Morrisons' consumer base compare to other UK supermarkets?

YouGov conducted a survey of 80,116 participants on 12 October 2016 charting the demographic characteristics of UK grocery shoppers. The survey did not differentiate between online and offline consumers, although with offline grocery expenditure still accounting for more than 90% of grocery purchases, it could be considered a broad proxy for the offline population. The results of this survey were used to compare the demographics of Morrisons' customers with those of other leading supermarkets in the UK. The demographic measures collected in the survey included 'social groupings' - as defined by the National Readership Survey (NRS) ([NRS, 2019](#)), gender, age and location.

Social grouping

The NRS social groupings were aggregated into two groups, where:

- **ABC1** comprised 'upper middle class', 'middle class' and 'lower middle class' consumers; and
- **C2DE** comprised 'skilled working class', 'working class' and 'non-working' consumers.

[Table 6.7](#) shows the distribution of customers between these two social groupings for nine major UK supermarkets.

Table 6.7: YouGov survey – proportion of customers by NRS social grouping

	Morrisons	Tesco	Sainsbury's	Asda	Aldi	Co-op	Waitrose	Lidl	Ocado
ABC1 (%)	57.5	58.3	63.6	53.9	54.5	58.8	73.1	56.4	77.3
C2DE (%)	45.0	41.7	36.4	46.1	45.5	41.2	26.9	43.6	22.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: [YouGov, 12 October 2016](#)

According to the YouGov survey, Morrisons had the third lowest proportion of ABC1 customers, consistent with its image as a 'value' supermarket. Among the nine largest supermarket chains nationally, only Aldi and Asda had lower than national proportions of ABC1 consumers.

Gender

[Table 6.8](#) shows that Morrisons' consumer-base had the highest proportion of female customers (55.7%) compared to the other eight supermarkets featured in the YouGov survey.

Table 6.8: YouGov survey – proportion of customers by gender

	Morrisons	Tesco	Sainsbury's	Asda	Aldi	Co-op	Waitrose	Lidl	Ocado
Female (%)	55.7	53.9	55.1	44.0	54.9	54.9	42.0	46.9	41.9
Male (%)	44.3	46.1	44.9	56.0	45.1	45.1	58.0	53.1	58.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: [YouGov, 12 October 2016](#)

Age

[Table 6.9](#) shows that Morrisons had the third highest proportion of customers aged 40-55+, consistent with their image as a more traditional retailer who have struggled historically to attract younger consumers. Seven of the nine supermarkets followed a similar pattern of age distribution with small numbers of consumers in the 18-24 age range; around a quarter in the 25-39 age bracket; around a third in the 40-54 age bracket; and around 40% in the 55+ category. There were two notable exceptions to this. Tesco had broadly a third in each of the 25-39, 40-54 and 55+ categories. Ocado's age distribution among the three older brackets was reversed. They had nearly 40% in the 25-39 age bracket, around a third in the 40-54 category and around a quarter in the 55+ category.

Table 6.9: YouGov survey – proportion of customers by age bracket

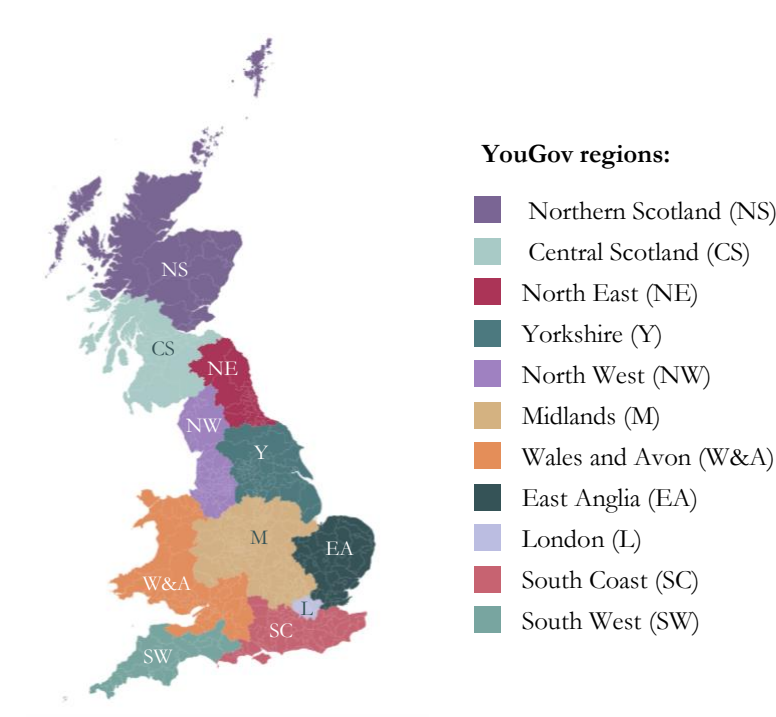
	Morrisons	Tesco	Sainsbury's	Asda	Aldi	Co-op	Waitrose	Lidl	Ocado
18-24 (%)	8.0	10.7	10.6	8.8	7.1	8.0	9.3	6.5	6.8
25-39	24.4	28.9	26.2	26.2	23.7	24.9	25.3	21.2	37.3

(%)									
40-54	28.6	29.9	29.1	31.7	28.4	30.6	28.4	29.0	31.2
(%)									
55+	39.0	30.6	34.1	33.3	40.8	36.5	37.1	43.3	24.7
(%)									
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Location

The YouGov survey grouped customers by non-standard regions formed from the aggregation of parliamentary constituency areas. Using boundary data published by the Office for National statistics, these regions were estimated to correspond to the map shown in [Figure 6.6](#).

Figure 6.6: Estimated YouGov regions - comprised of parliamentary constituencies



Source: Park (2019); [YouGov, 12 October 2016](#)

Table 6.10: YouGov survey – proportion of customers by YouGov region

	Morrisons	Tesco	Sainsbury's	Asda	Aldi	Co-op	Waitrose	Lidl	Ocado
London (%)	13.0	21.2	27.4	13.3	9.3	15.3	37.8	17.4	42.9
South coast (%)	7.5	10.8	12.5	8.8	7.1	11.0	16.8	10.0	16.0
West country (%)	3.1	3.5	3.4	2.2	2.9	4.0	2.8	5.4	0.0
Midlands (%)	15.3	13.3	13.9	14.4	18.6	15.7	10.8	12.2	17.4
East Anglia (%)	7.0	8.4	7.1	5.7	7.1	8.2	10.0	6.8	6.5
North East (%)	5.3	3.8	3.9	6.8	6.4	3.0	0.0	4.3	0.0
Yorkshire (%)	16.3	9.6	10.0	12.6	13.4	13.2	4.6	9.5	6.2
Wales and Avon (%)	9.6	9.8	7.6	9.3	8.9	8.9	8.0	12.7	4.8
Central Scotland (%)	8.0	6.8	4.9	9.0	6.8	7.3	3.3	8.9	0.0
North West (%)	11.5	9.8	7.7	14.4	16.3	9.3	4.3	9.1	5.2
Northern Scotland (%)	0.0	2.2	0.0	2.3	2.2	3.0	0.0	2.8	0.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: [YouGov, 12 October 2016](#)

[Table 6.10](#) shows that Morrisons' consumer-base was most concentrated in its Yorkshire heart-land (16.3%). This was the highest nationally, nearly three percentage points higher than the proportion of Aldi's customers residing in Yorkshire. Morrisons had the second lowest proportion of London and South coast-based consumers.

6.2.2 How do the demographics of the online consumer-base compare to the offline consumer-base?

To determine the demographic make-up of Morrisons' online consumer-base a sample of just under 80,000 unique users (who had been tagged with Google Analytics demographic characteristics) was extracted. Harmonisation was conducted to align the sample to the YouGov age brackets and regions (see Section 4.3.2).

[Table 6.11](#) summarises the online and offline demographics of Morrisons consumers in 2016.

Social grouping

The proportion of Morrisons' consumer-base in the more affluent ABC1 social grouping was 15.8 percentage points higher among its online consumers than the offline consumer-base. This suggests that either Morrisons is attracting more ABC1 consumers with its online offering, or that only the more affluent of its existing consumers are engaging with the online platform.

Gender

The proportion of female consumers was higher than the proportion of male consumers online.

Age

The proportion of consumers in the 15-54 age range was higher among Morrisons' online consumer-base than its offline consumer-base. Interestingly, the estimated proportion of consumers aged 18-24 was lower online – contradicting the frequent assumption that 'Millennials' engage more with online shopping. The £40 minimum spend per shop may account for the higher proportion of 'working age' and affluent consumers online.

Location

The geographic distribution of online consumers is consistent with the reach of Morrisons' online delivery service in 2016. Online was initially available in the midlands, the North West, parts of the South West, London and Yorkshire. It has since expanded its delivery reach to include the South Coast, East Anglia, the North East and southern Scotland.

Table 6.11: YouGov survey Morrisons sample vs. online Morrisons sample, Oct 2016

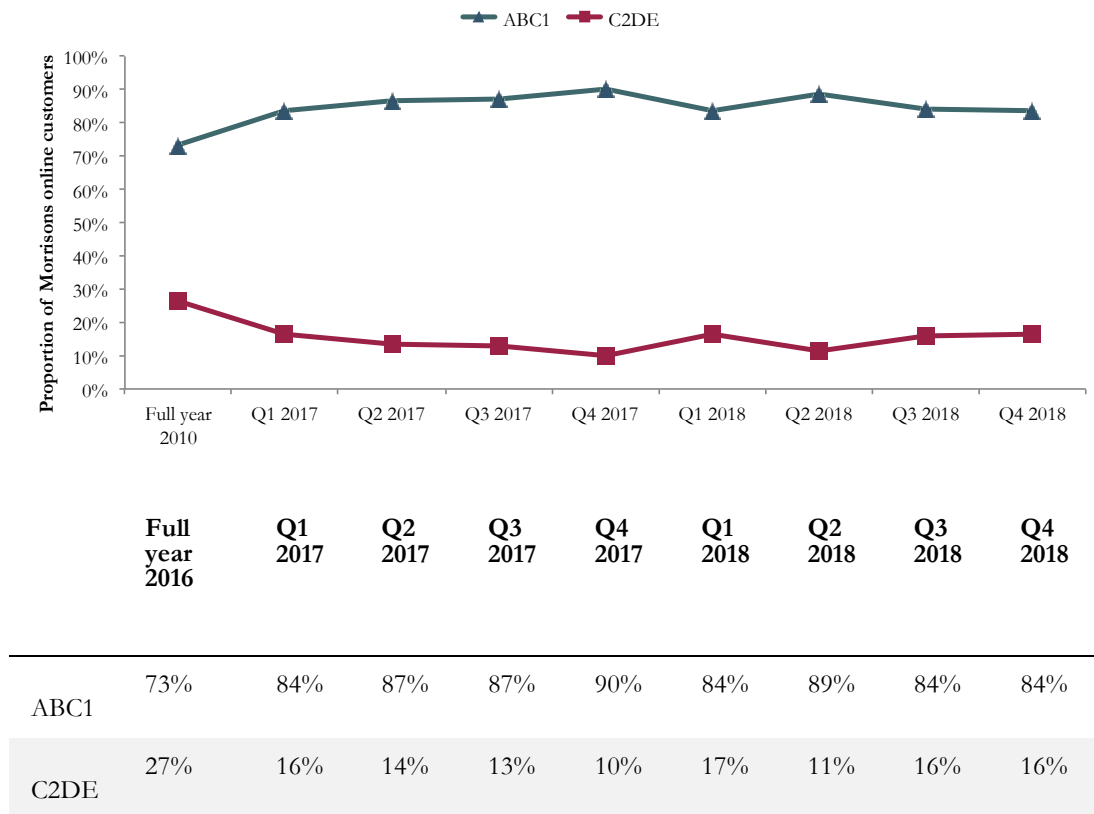
	Morrisons (online)	Morrisons (YouGov)	Percentage point difference Online - YouGov
ABC1 (%)	73.3	57.5	+15.8
C2DE (%)	26.7	42.5	-15.8
Female (%)	66.3	55.7	+10.6
Male (%)	33.7	44.3	-10.6
18-24 (%)	2.7	8.0	-5.3
25-39 (%)	44.0	24.4	+19.6
40-54 (%)	25.2	28.6	-3.4
55+ (%)	28.1	39.0	-9.9
London (%)	14.4	13.0	+1.4
South coast (%)	3.2	7.5	-4.3

West country (%)	0.7	3.1	-2.4
Midlands (%)	37.6	15.3	+22.3
East Anglia (%)	2.2	7.0	-4.8
North East (%)	0.4	5.3	-4.9
Yorkshire (%)	21.9	16.3	+5.6
Wales and Avon (%)	6.5	9.6	-3.1
Central Scotland (%)	0.0	8.0	-8.0
North West (%)	13.1	11.5	+1.6
Northern Scotland (%)	0.0	0.0	-

Source: [YouGov, 12 October 2016](#)

6.2.3 How have the demographics of consumers changed since online inception?

[Figure 6.7](#) shows that the proportion of Morrisons' online consumers belonging to the ABC1 social grouping rose in every quarter of 2017, peaking at 90% in Q4 2017. The proportion has fallen slightly since but remains much higher than among the YouGov 'offline' sample.

Figure 6.7: Social grouping distribution by quarter, 2016 to 2018

[Figure 6.8](#) shows that in 2016, around two thirds of the consumer-base were female.

This has trended upwards to 90% in Q4 2018. In the YouGov 'offline' sample, just over half of the consumer-base were reported to be female. The increase in the proportion of female consumers stands contrary to assertions that the companionate marriage is associated with an equalisation of labour in the home.

Figure 6.8: Gender distribution by quarter, 2016 to 2018

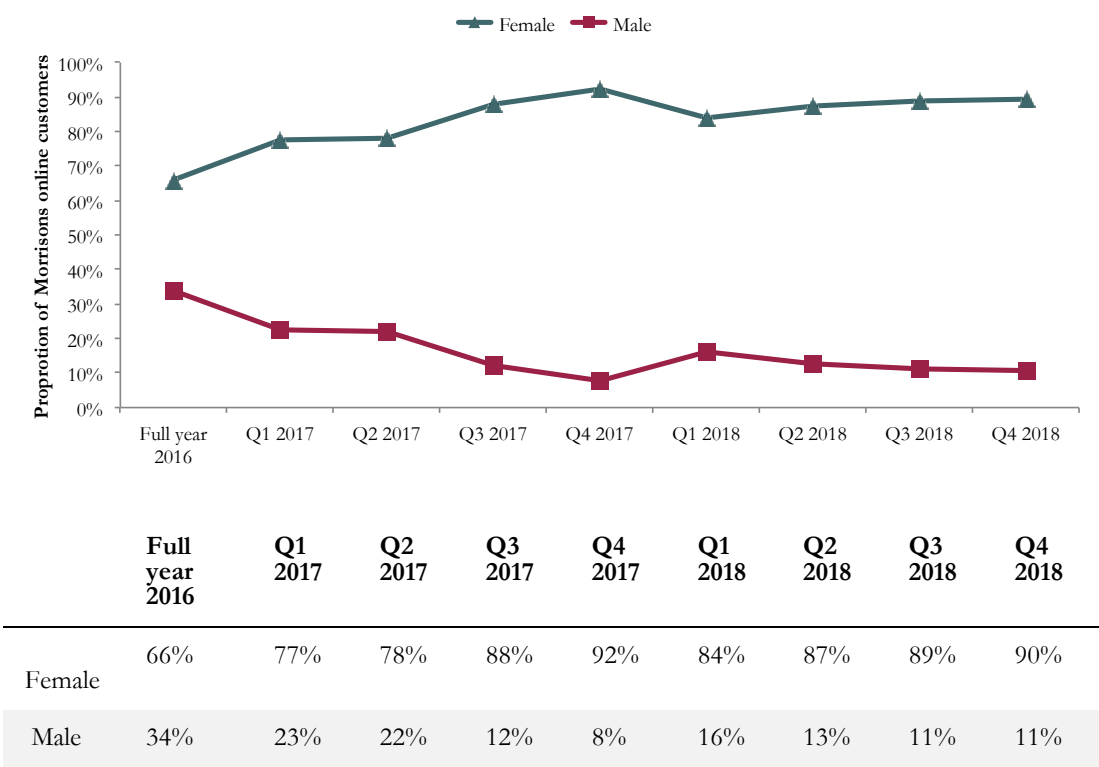
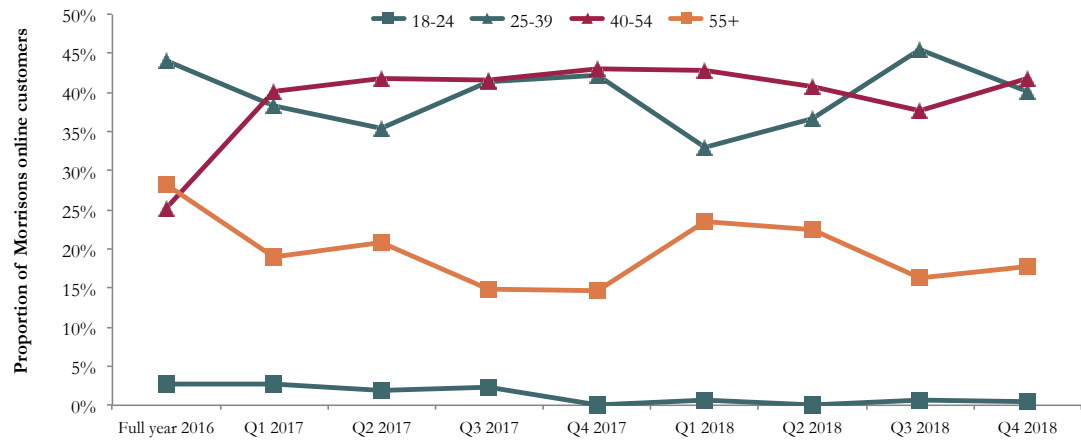


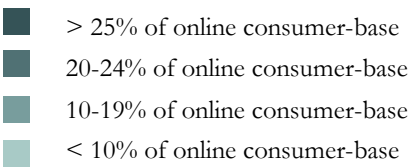
Figure 6.9: Age distribution by quarter, 2016 to 2018



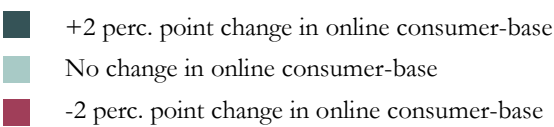
Age bracket	Full year 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018
18-24	3%	3%	2%	2%	0%	1%	0%	1%	1%
25-39	44%	38%	36%	41%	42%	33%	37%	46%	40%
40-54	25%	40%	42%	42%	43%	43%	41%	38%	42%
55+	28%	19%	21%	15%	15%	24%	23%	16%	18%

Figure 6.10: Location of Morrisons' online customers

a) Distribution Morrisons' online customers in 2016



b) Change in distribution of Morrisons' online customers between 2016 and 2018



Summary of results

Hypothesis 2: The demographic composition of the online consumer-base is the same as the offline consumer-base

Social grouping

- The proportion of Morrisons' consumers belonging to the more affluent 'ABC1' grouping was nearly 16 percentage points higher among online customers in 2016.

Gender

- The proportion of female customers among Morrisons' offline consumer-base was estimated to be just over half in 2016. By Q4 2017, 90% of Morrisons' online consumer-base were reported to be female.

Age

- The proportion of Morrisons' online consumers in the 25-39 age band was nearly 20 percentage points higher than among the 'offline' YouGov survey participants. Despite this, the 18-24 age group was the most underrepresented – just 2.7% of Morrisons' online audience and around 8% of its offline audience were in this age bracket.

Location

- The location of consumers has changed since inception, in line with the increased coverage of Morrisons' online service. Despite this, the majority of customers remain in Morrisons' offline 'heartlands' of Yorkshire and the North East.

6.3 Hypothesis 3: Online consumers are price-sensitive

Assessing how price-sensitive consumers are is challenging. Consumers may engage in a wealth of strategies to work within their budgets, many of which are not empirically visible in transaction data. Findings from focus groups with consumers suggested that customers do actively look for ‘offers’ online and this formed the basis of looking for price-sensitive behaviours online. Average basket size and how this has changed since Morrisons’ online inception were also considered to see whether online consumers are becoming more or less price-sensitive over time.

6.3.1 Are consumers’ on-site behaviours price-sensitive?

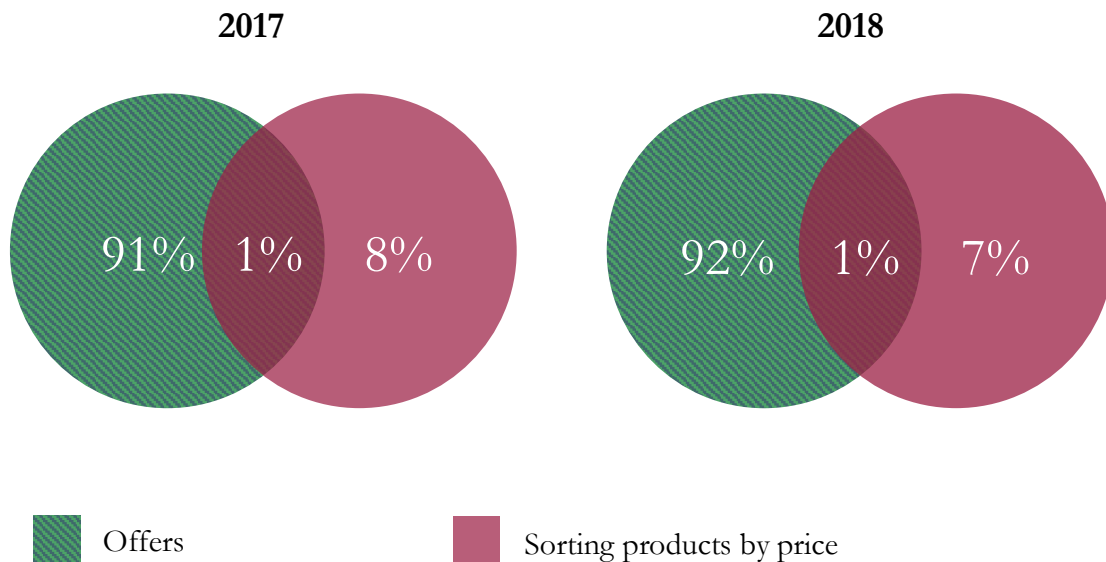
‘Price-sensitive’ behaviours were defined as those emanating from engagement with offers, meal deals, flash sales and bundle deals, and those where search results were ordered by ascending price.

In 2017, 9% of products in consumers’ baskets were added from demonstrably price-sensitive behaviours. In 2018, the proportion was 7% suggesting that shoppers in 2018 were less price-sensitive than those in 2017.

[Figure 6.11](#) shows that the proportion of price-sensitive adds to basket emanating from ‘offers’ and ordering products by ‘price ascending’ was broadly unchanged between 2017 and 2018.

Figure 6.11: Breakdown of source of 'product adds to basket' among price-sensitive adds to basket

Showing: proportion of product adds from 'offers'; proportion of products adds from ordering products by 'price ascending' and proportion of products adds from 'offers' that are also sorted by 'price ascending', 2017 and 2018



[Tables 6.12](#) and [6.13](#) confirm that in 2017 and 2018, the vast majority (around 90%) of 'net product adds to basket' among Morrisons' customers emanated from 'price-insensitive' online behaviours. There is little evidence that consumers are becoming more price-sensitive in-terms of their on-site behaviour.

Table 6.12: Net product adds to basket from price-sensitive and price-insensitive on-site behaviours, 2017

	Product adds	Product removes	Net product adds	Proportion of net product adds
\neg Price-sensitive	138,151,631	22,506,352	115,645,279	90.6%
<i>Price-sensitive</i>				9.4%
\neg Offers \cap price ascending	1,046,136	98,043	948,093	0.7%
Offers \cap \neg price ascending	12,354,252	1,419,574	10,934,678	8.6%
Offers \cap price ascending	101,930	8,056	93,874	0.1%
\neg Not \cap And				

Table 6.13: Net product adds to basket from price-sensitive and price-insensitive on-site behaviours, 2018

	Product adds	Product removes	Net product adds	Proportion of net product adds
\neg Price-sensitive	158,351,147	25,918,055	132,433,092	93.3%
<i>Price-sensitive</i>				6.7%
\neg offers \cap price ascending	787,651	81,444	706,207	0.5%
Offers \cap \neg price ascending	10,365,929	1,644,839	8,721,090	6.1%
Offers \cap price ascending	68,773	5,637	63,136	0.0%
\neg Not \cap And				

6.3.2 Are Morrisons' online shoppers more price-sensitive than online shoppers nationally?

According to the Living Costs and Food survey (LCF) The average weekly expenditure on line per active online shopper rose by approximately four pounds between 2016 and 2017.

Table 6.14: LCF survey 2016, 2017 online expenditure

	2016	2017
Proportion of weekly grocery expenditure purchased online	8%	7%
Est. proportion of population who shopped online (online sample size / all channels sample size)	13%	10%
Avg. weekly expenditure online per active online shopper ¹	£35.65	£39.77

Source: LCF 2016, 2017; Families and households: 2016, 2017 (Bulman, 2017; Sanders, 2019)

¹ Based on there being 27.1m households in the UK in 2016 and 27.2m households in the UK in 2017.

Among the Morrisons' online sample, the inflation adjusted average basket size was lower than the LCF national figure in both 2016 and 2017. The average basket size was around £1.20 lower in 2016 and around £0.90 lower than nationally in 2017. This may underestimate the disparity, since it assumes that Morrisons online consumers shop every week, which many do not.

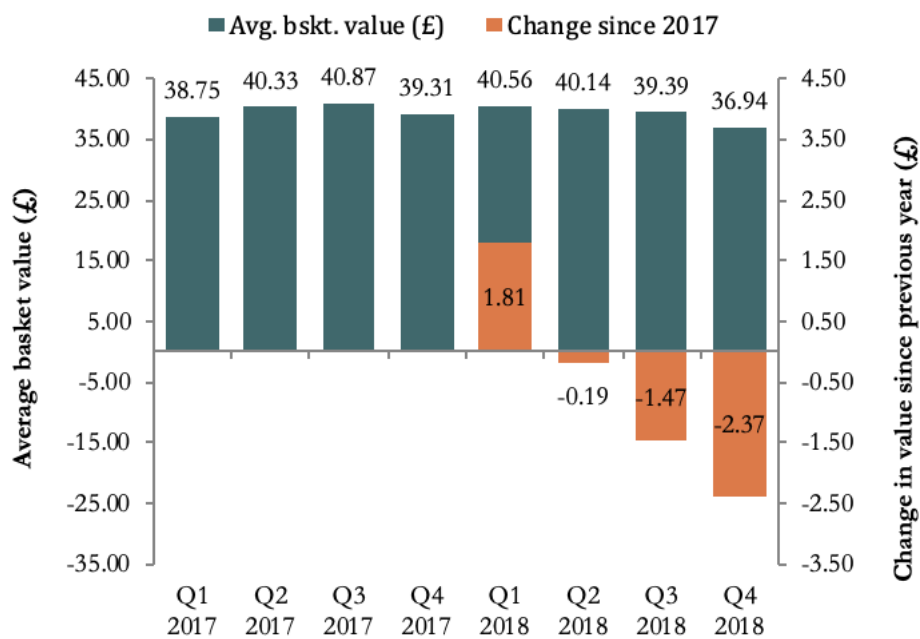
Table 6.15: Morrisons online average basket value per transaction, 2016 and 2017

	2016	2017
Average basket size (nominal)	£33.56	£39.81
Average basket size (real) ¹	£34.37	£38.81

¹ CPI deflated, in line with the LCF survey methodology, CPI food for 2016 = -2.4%, CPI food for 2017 = +2.5%

6.3.3 How are Morrisons' average basket values changing over time?

Figure 6.12 Nominal average basket value by quarter, 2017 to 2018



There is some evidence that average basket values are decreasing over time ([Figure 6.12](#)), although since volumes and revenues have increased this may indicate the addition of more price-sensitive consumers or smaller households rather than existing consumers reducing their basket value.

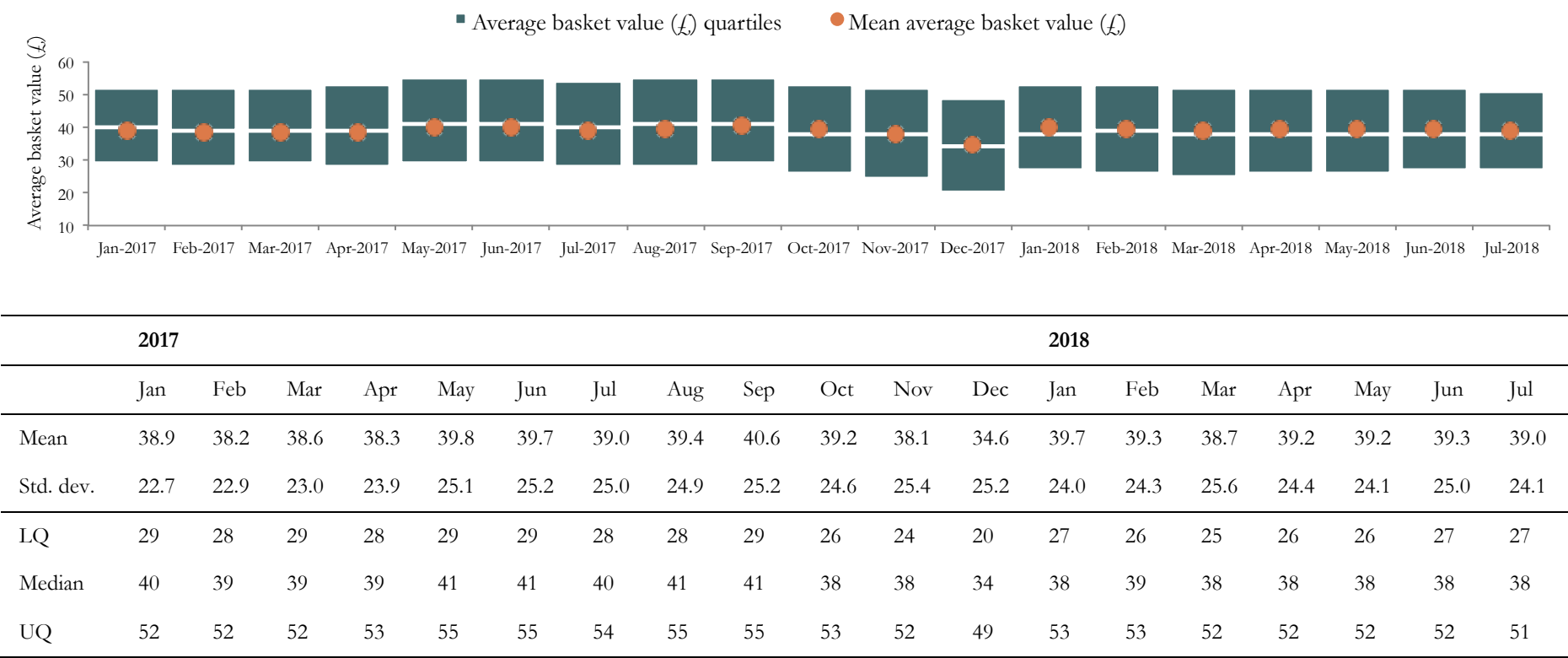
Long-term customers

For consumers who were active users in every quarter between Q1 2017 and Q3 2018, nominal average basket values followed a similar pattern as for all users ([Figure 6.13](#)). Basket values have remained fairly consistent with the mean and median average basket values 'hugging' the minimum order value of £40.

Summary of results*Hypothesis 4: Online customers are price-sensitive*

- The vast majority (around 90%) of 'net product adds to basket' among Morrisons' customers emanated from 'price-insensitive' online behaviours. There is also little evidence that consumers are becoming more price-sensitive in-terms of their on-site behaviour.
- There is some evidence that Morrisons online consumers spend less than online consumers nationally.
- There is some evidence that new or transient Morrisons consumers spend less per transaction than established long-term users.
- There is some evidence that the average basket value is falling over time, although analysis of the long-term users suggests that existing users' basket values are not changing over time (except due to seasonal fluctuations).
- Broadly speaking, the average basket size appears to 'hug' the minimum order value of £40 among established and transient Morrisons' customers.

Figure 6.13: Nominal average basket size per month for users that placed an order every quarter between Q1 2017 and Q3 2018



6.4 Hypothesis 4: Online consumers are ‘time-poor’

6.4.1 How long do consumers spend grocery shopping online?

In 2017, around 33k transactions were tagged to monitor the time spent on each page. Summing these over multiple pages and days, the mean time spent on each transaction was 72.7 minutes and the median was 46.7 minutes.

In 2018, tagging was in place for over a quarter of a million transactions. The mean time spent on each transaction was higher at 82.0 minutes, whilst the median was 50.0 minutes.

Table 6.16: Time on site in minutes for all transactions in sample

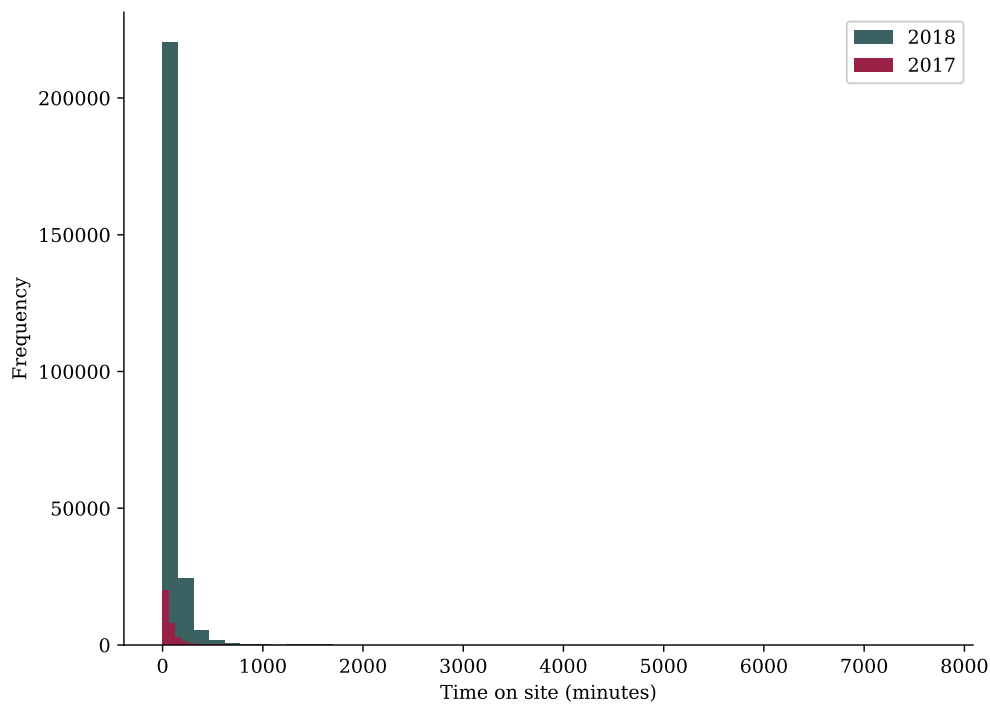
	2017	2018
Mean	72.7	82.0
Std. dev.	87.9	123.4
Minimum	0.0	0.0
Median	46.7	50.0
Maximum	3,040.6	7,701.6

The maximum length transaction in 2018 was 128 hours over 21 days. It is likely that this is either a test order administered by Morrisons' staff, or a Google Analytics tracking error. With known instability of Google Analytics tracking, the sensitivity to these outliers is high. In this circumstance, the median is a more robust measure of the average.

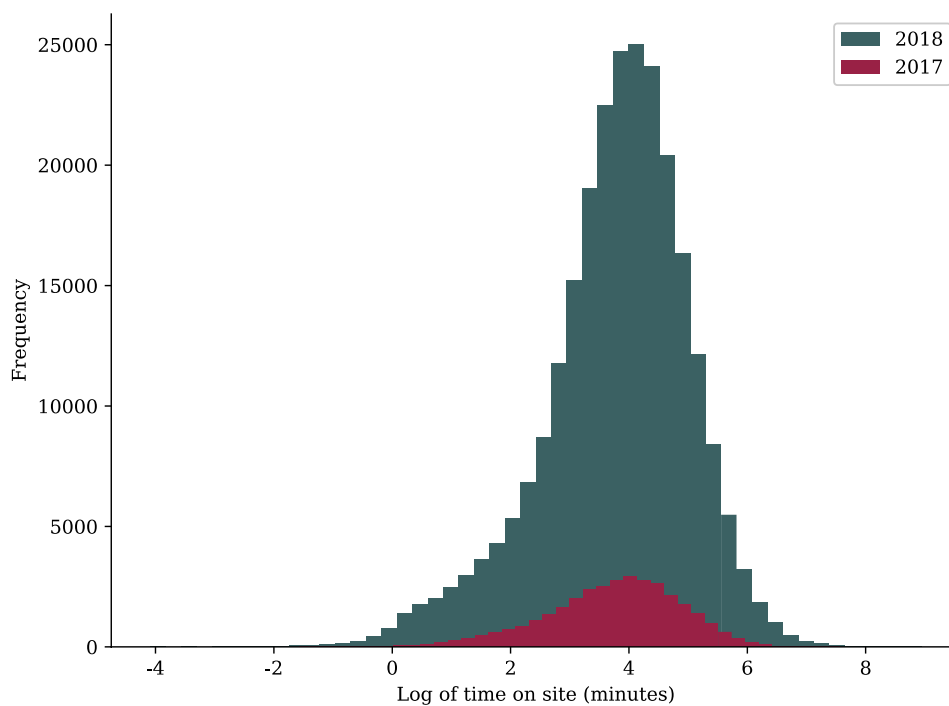
6.4.2 Was there a difference between time-on-site per transaction in 2017 and 2018?

[Figure 6.14](#) shows that the time spent on-site per transaction in 2017 and 2018 had similar distributions, with the majority of transactions complete in less than 60 minutes.

Figure 6.14: Time on site in minutes for all transactions in samples, 2017 and 2018



Plotting the logarithm of the time on site illustrates the differences between 2017 and 2018 more clearly. [Figure 6.15](#) shows high kurtosis (variability) among the 2018 sample compared to the 2017 sample.

Figure 6.15: Log of time on site in minutes for all transactions in samples, 2017 and 2018

The heavy right skew in [Figure 6.15](#) suggests that neither sample is normally distributed. This is confirmed by inspection of the quartile-quartile plots and Shapiro-Wilk tests of normality ([Table 6.17](#)). Calculation of the kurtosis and skew confirm they are non-normal.

Table 6.17: Tests of normality for time spent on site

2017	2018
Shapiro-Wilk test for normality	Shapiro-Wilk test for normality
Test-statistic: 0.651	Test-statistic: 0.495
p-value: <.01	p-value: <.01
Kurtosis: 86.33	Kurtosis: 371.99
Skew: 5.56	Skew: 11.91

There was clear evidence that time on site is non-normal and the non-parametric Mann-

Whitney U-test was used to compare the 2017 and 2018 samples by proposing the hypothesis:

H_{04.1} ‘Time-on-site per transaction’ in 2017 was not statistically different from ‘time on site per transaction’ in 2018.

H_{A4.1} ‘Time-on-site per transaction’ in 2017 was statistically less than ‘time on site per transaction’ in 2018.

A one-tailed Mann-Whitney U-test resulted in a test-statistic of >4 billion and a p-value <.01, providing evidence to reject the null hypothesis, suggesting with 99% confidence that the time-on-site per transaction was higher in 2018 than 2017.

Given the large sample size, the significance of the test is not surprising. To provide a more intuitive interpretation of the result, a confidence interval for the difference in medians of 1000 random bootstrap samples taken from the 2017 and 2018 datasets was calculated. This yielded a 99% CI of [2.4, 4.4] for the difference in medians. Given that zero is not contained within this confidence interval, there is **evidence that the sample medians differ, i.e. that the median ‘time-on-site per transaction’ in 2017 was statistically different from the median ‘time on site per transaction’ in 2018.**

Despite this, the median difference is only a few minutes – the trend over a number of years would be more conclusive.

Did one-day shoppers spend the same time-on-site per transaction as multi-day shoppers?

Looking at transactions that were completed on one day compared to those edited over a number of days shows that the average time spent transacting was lower for one-day

transactions. This is not surprising given that each edit requires checking out the basket and reconfirming payment details. As for the comparison between 2017 and 2018 data, the mean is sensitive to outliers such that the median is a more robust average. The multi-day shoppers spend on average three days per transaction and a total of 96.5 minutes per transaction.

Table 6.18: Time on site in minutes for all transactions in sample

	One-day	Multi-day	Multi-day per day
Mean	46.2	138.8	39.5
Std. dev.	47.7	170.7	32.7
Minimum	0.0	0.0	0.1
Median	33.1	96.5	31.2
Maximum	1,413.3	7,701.6	737.1

To test for a difference between the one-day and multi-day shopper samples the following null and alternative hypotheses were proposed:

H_{04.2} ‘Time on site per transaction’ for one-day shoppers was not statistically different to ‘time on site per transaction’ for multi-day shoppers.

H_{A4.2} ‘Time on site per transaction’ for one-day shoppers was statistically less than ‘time on site per transaction’ for multi-day shoppers.

A one-tailed Mann-Whitney U-test resulted in a test-statistic of >3 billion and a p-value of <.01, providing evidence to reject the null hypothesis, suggesting with 99% confidence that the average time-on-site per transaction for multi-day shoppers was higher than for one-day shoppers.

As before, a confidence interval for the difference in medians of 1000 random bootstrap samples taken from the one-day and multi-day datasets was calculated. This yielded a 99% CI of [62.7,64.4] for the difference in medians. Given that zero is not contained within this confidence interval, there is **strong evidence that the sample medians differ, i.e. that the median ‘time-on-site per transaction’ among multi-day shoppers was statistically different from the median ‘time on site per transaction’ among one-day shoppers.**

Did one-day shoppers spend the same time-on-site per transaction as multi-day shoppers did per day?

When the total time spent on a transaction is divided by the average number of days per transaction, the mean average time spent on each transaction per day (for multi-day transactions) was around seven minutes lower than for one-day shoppers. The median average was just one minute lower for multi-day shoppers. The time spent on-site per transaction per day was compared between the one-day and multi-day shoppers with the null and alternative hypotheses:

H_{04.3} ‘Time on site per transaction per day’ for one-day shoppers was not statistically different to ‘time on site per transaction per day’ for multi-day shoppers.

H_{A4.3} ‘Time on site per transaction per day’ for one-day shoppers was statistically more than ‘time on site per transaction per day’ for multi-day shoppers.

A one-tailed Mann-Whitney U-test resulted in a test-statistic of >9 billion and a p-value <.01, providing evidence to reject the null hypothesis, suggesting with 99% confidence that the ‘time-on-site per transaction per day’ for the one-day was statistically different from the ‘time-on-site per transaction per day’ for the multi-day shoppers.

Again, a confidence interval for the difference in medians of 1000 random bootstrap samples taken from the one-day and multi-day datasets was calculated. This yielded a 99% CI of [1.5, 2.2] for the difference in medians. Given that zero is not contained within this confidence interval, there is **evidence that the sample medians differ, i.e. that the median ‘time-on-site per transaction per day’ among multi-day shoppers was statistically different from the median ‘time on site per transaction’ among one-day shoppers. However, the difference is slight. The results suggest that multi-day shoppers spend almost as much time per day of their multi-day transaction as one-day shoppers do in total.**

Did one-day shoppers spend the same time-on-site per transaction in 2017 as one-day shoppers in 2018?

Table 6.19: Time on site in minutes for those transacting on one day only in sample

	One-day 2017	One-day 2018
Mean	60.1	43.6
Std. dev.	65.9	43.1
Minimum	0.0	0.0
Median	39.6	32.1
Maximum	1,413.3	820.1

H_{04.4} ‘Time on site per transaction’ for one-day shoppers in 2017 was not statistically different to ‘time on site per transaction’ for one-day shoppers in 2018.

H_{A4.4} ‘Time on site per transaction’ for one-day shoppers in 2017 was statistically different to ‘time on site per transaction’ for one-day shoppers in 2018.

A one-tailed Mann-Whitney U-test resulted in a test-statistic of >1.8 billion and a p-value <.01, providing evidence to reject the null hypothesis, suggesting with 99%

confidence that the time-on-site per transaction for one-day shoppers in 2018 was lower than the time-on-site per transaction for one-day shoppers in 2017.

A confidence interval for the difference in medians of 1000 random bootstrap samples taken from the 2017 and 2018 one-day datasets was calculated. This yielded a 99% CI of [6.6, 8.4] for the difference in medians. Given that zero is not contained within this confidence interval, there is **moderate evidence that the sample medians differ, i.e. that the median ‘time-on-site per transaction’ among one-day shoppers in 2017 was statistically different from the median ‘time on site per transaction’ among one-day shoppers in 2018.**

Did multi-day shoppers spend the same time-on-site per transaction in 2017 as multi-day shoppers in 2018?

Table 6.20: Number of days per transaction for multi-day orders

	Multi-day 2017	Multi-day 2018
Count of transactions	~6k	~102k
Mean day count	2.3	3.6
Median day count	2.0	3.0

Table 6.21: Time on site in minutes for all transactions in sample

	Multi-day 2017	Multi-day 2018	Multi-day per day 2017	Multi-day per day 2018
Mean	133.7	139.1	57.2	38.5
Std. dev.	139.8	172.2	52.4	30.9
Minimum	1.1	0.2	0.6	0.1
Median	94.4	96.6	42.5	30.8
Maximum	3,040.6	7,701.6	656.5	737.1

H_{04.5} ‘Time on site per transaction per day’ for multi-day shoppers in 2017 was not statistically different from ‘time on site per transaction’ for multi-day shoppers in 2018.

H_{A4.5} ‘Time on site per transaction per day’ for multi-day shoppers in 2017 was statistically more than ‘time on site per transaction’ for multi-day shoppers in 2018.

A one-tailed Mann-Whitney U-test resulted in a test-statistic of 22 million and a p-value of $<.01$, providing evidence to reject the null hypothesis, suggesting with 99% confidence that the time-on-site per transaction per day for multi-day shoppers in 2018 was lower than the time-on-site per transaction per day for multi-day shoppers in 2017.

A confidence interval for the difference in medians of 1000 random bootstrap samples taken from the 2017 and 2018 multi-day datasets was calculated. This yielded a 99% CI of [10.2, 13.0] for the difference in medians. Given that zero is not contained within this confidence interval, there is **strong evidence that the sample medians differ, i.e. that the median ‘time-on-site per transaction per day’ among multi-day shoppers in 2017 was statistically different from the median ‘time on site per transaction per day’ among multi-day shoppers in 2018.**

6.4.3 Time-poor behaviours on-site

Looking at the page from which products were added to basket shows little evidence of time-poor behaviours. In 2017, 11% of product adds to basket originated from time-poor behaviours; and an even smaller proportion, just 3% in 2018 ([Table 6.22](#)).

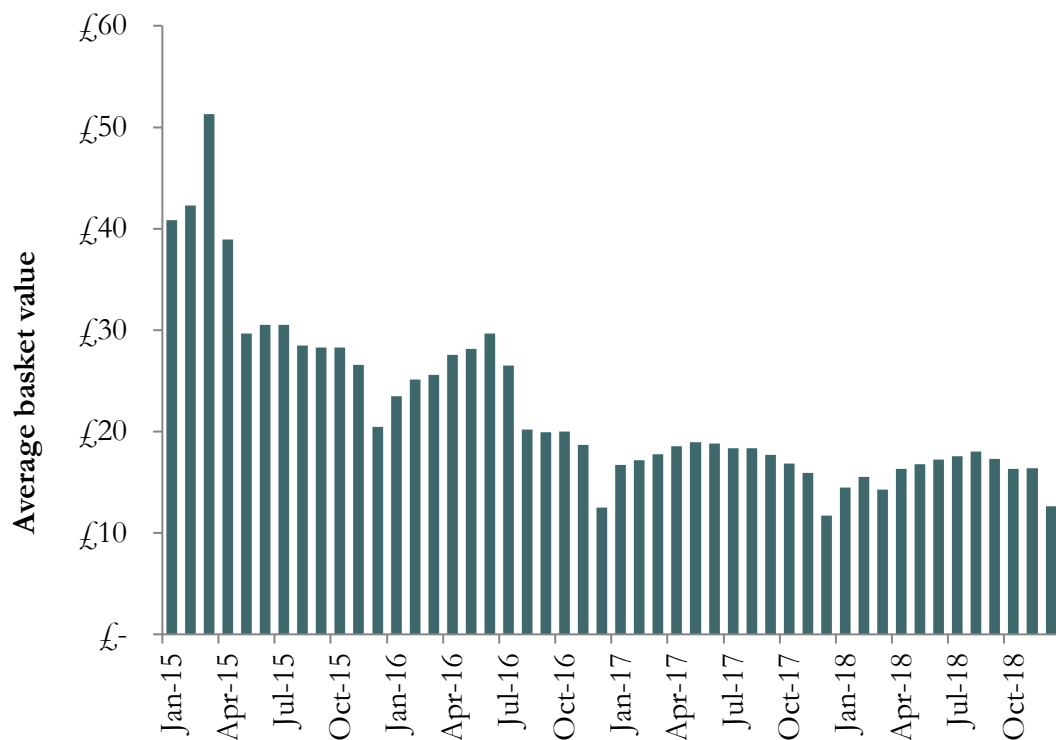
Table 6.22: Time poor behaviours: product adds to basket

		Product adds	Product removes	Net product adds	Net product adds
2017	\neg time-poor	150,361,257	23,930,371	126,430,886	89%
	time-poor	1,292,692	101,654	1,191,038	11%
2018	\neg time-poor	164,363,775	27,309,433	137,054,342	97%
	time-poor	5,209,725	340,542	4,869,183	3%

Time on site is likely to be a more robust measure however, due to the complexity of page labelling and site layout over the two years. One factor that may be significantly underestimated in this tracking is the pre-population of baskets from previous orders / regulars which both Ocado and Morrisons implements. These may not show as adds to basket in tracking but mean that users baskets are pre-populated with most of the order, with users just removing or adding a few items to complete their order.

6.5 Hypothesis 5: It is difficult to disrupt online baskets

Figure 6.16: Morrisons' average basket value (£) between 2015 and 2018



In the early months of Morrisons online offering, average basket values appeared to be higher and more volatile ([Figure 6.16](#)). Tracking of users was however sparse in this early phase. The average basket values have stabilised since the start of 2017, in line with increased user numbers and increased tagging of user activity across the site.

The stability of basket content was estimated by looking at how products were added to basket on-site. A sample of around 100 million product adds to basket was considered for 2017 and 2018. Stable product adds were defined as those added to basket from 'favourites', saved shopping lists and previous orders. In 2017, 49.8% of products added to basket emanated from 'stable' activities. The proportion was slightly lower at 48.4%.

[Table 6.23](#) shows that in 2017 46.4% of the disruptive 'unstable' product adds came from engagement with the site search feature. This rose to 61.4% in 2018, whilst the use

of the hierarchical catalogue menu fell by 6.4 percentage points. The proportion of net product adds from engaging with offers also fell between 2017 and 2018.

Table 6.23: Stable and unstable net product adds to basket for a sample of ~100 million items in 2017 and 2018

	Net product adds to basket	
	2017	2018
Stable	49.8%	48.4%
¬ Stable	50.2%	51.6%

Table 6.24: Breakdown of net unstable adds to basket for 2017 and 2018

	Net product adds to basket	
	2017	2018
Offers	22.0%	14.5%
Catalogue	29.0%	22.6%
Search	46.4%	61.4%
Checkout	6.1%	4.5%

Summary of results

Hypothesis 5: It is difficult to disrupt online baskets

- The average basket value has stabilised since Morrisons' online inception, but shows seasonal fluctuations with the least spent per transaction at Christmas.
- Around half of all products added to basket emanate from 'stable' on-site behaviours such as engagement with previous orders and 'favourites' lists.
- There has been a shift in on-site behaviour with respect to 'unstable' product adds to basket. Consumers were much more likely to populate their baskets from search results rather than by using the product catalogue or clicking on offers in 2018 than in 2017.

6.6 Hypothesis 6: Basket composition is the same online and offline

6.6.1 Do consumers shop for the same things online and offline?

The Living Costs and Food survey (LCF) seeks to estimate UK household expenditure for an array of items including food. To ascertain whether consumers shop for the same sorts of products online and offline, the results of the LCF for 2016 and 2017 were consulted. The estimated national weekly expenditure by food category and channel (online and offline) for 2016 and 2017 is shown in [Tables 6.25](#) and [6.26](#).

Table 6.25: LCF 2016 - estimated UK weekly expenditure (£m) for the financial year ending 2017 by food category and channel

	Weekly expenditure (£m)		Weekly expenditure (%) ¹		Percentage point difference
	Offline	Online	Offline	Online	Online - Offline
Bread and cereals	161	13	11	11	0
Sugars and confectionary	195	14	13	11	-2
Meat	311	23	21	19	-3
Fish and seafood	69	6	5	5	0
Dairy and equivalents	174	16	12	13	1
Fats	31	3	2	2	0
Fruit and veg	317	26	22	21	0
Potatoes	20	1	1	1	-1
Non-alcoholic drinks	117	12	8	10	+2
Other	61	8	4	7	+2
All product categories	1,456	122			

¹ Figures may not sum due to rounding

Table 6.26: LCF 2017 - estimated UK weekly expenditure (£m) for the financial year ending 2018 by food category and channel

	Weekly expenditure (£m)		Weekly expenditure (%) ¹		Percentage point difference
	Offline	Online	Offline	Online	Online - Offline
Bread and cereals	173	12	11	11	-1
Sugars and confectionary	208	12	14	11	-3
Meat	329	20	21	18	-4
Fish and seafood	74	6	5	5	+1
Dairy and equivalents	182	14	12	13	+1
Fats	36	3	2	3	0
Fruit and veg	330	24	21	21	0
Other	63	8	4	7	+3
Non-alcoholic drinks	121	12	8	11	+3
Potatoes	20	1	1	1	0
All product categories	1,536	112			

¹ Figures may not sum due to rounding

The proportion of spending on meat and sugars and confectionary appears to be lower online than offline. To establish whether the distribution of spending among food categories was significantly different online and offline a 2-sample χ^2 test of independence was conducted for each of 2016 and 2017.

H_{06.1}: Channel of purchase was independent of basket composition by food category in the UK in 2016.

H_{06.2}: Channel of purchase and basket composition by food category was independent in the UK in 2017.

Table 6.27: LCF online vs. LCF offline χ^2 test of independence for 2016 and 2017

	2016	2017
df	9	9
α	0.01	0.01
χ^2 - crit	21.66	21.66
χ^2	156.77 >> χ^2 - crit	252.05 >> χ^2 - crit
p-value	<.01	<.01
Interpretation	Strong evidence to reject H_{06.1}	Strong evidence to reject H_{06.2}

The results of the χ^2 -test of independence indicate strong evidence to reject the null hypothesis of independence. This suggests that there is a relationship between the channel of purchase (online or offline) and the food categories of comprising the average basket.

Examination of the adjusted standardised residuals ([Table 6.28](#)) reveals that the major contributors to the difference between the LCF online and offline samples in 2016 was the proportions of revenue from ‘Sugars and confectionary’ and ‘Meat’ (which were underweight in the online sample); and the ‘Other’ and ‘Non-alcoholic drinks’ categories (which were overweight in the online sample). There was also evidence that online baskets contained a higher proportion of dairy products than offline baskets; and that online baskets contained lower proportions of potatoes than offline baskets.

Table 6.28: LCF online vs. LCF offline – adjusted residuals 2016

	Offline	Online	Significant at $\alpha_{\text{Bon}} = \frac{0.01}{20}$ level ¹
Bread and cereals	0.98	-0.98	
Sugars and confectionary	4.33	-4.33	x
Meat	4.70	-4.70	x
Fish and seafood	-0.64	0.64	
Dairy and equivalents	-2.74	2.74	
Fats	-1.74	1.74	
Fruit and veg	0.85	-0.85	
Potatoes	3.70	-3.70	
Non-alcoholic drinks	-5.03	5.03	x
Other	-8.86	8.86	x

¹ Bonferroni adjusted α with z -score = 3.49

In 2017, the primary contributors to the difference between online and offline basket composition were unchanged ([Table 6.29](#)).

Table 6.29: LCF online vs. LCF offline – adjusted residuals 2017

	Offline Adj. resid.	Online Adj. resid.	Significant at $\alpha_{\text{Bon}} = \frac{0.01}{20}$ level ¹
Bread and cereals	1.28	-1.28	
Sugars and confectionary	6.12	-6.12	x
Meat	6.42	-6.42	x
Fish and seafood	-1.85	1.85	
Dairy and equivalents	-1.48	1.48	
Fats	-1.62	1.62	
Fruit and veg	0.10	-0.10	
Potatoes	2.69	-2.69	
Non-alcoholic drinks	-7.67	7.67	x
Other	-11.04	11.04	x

¹ Bonferroni adjusted α with z -score = 3.49

6.6.2 How do Morrisons online consumers compare to online consumers nationally?

The results of the LCF were also used to see how Morrisons' online consumers compared to online consumers nationally and thus to ascertain whether the detailed Morrisons dataset is a good proxy for online behaviour at the national level ([Table 6.30](#), [Table 6.31](#)).

Table 6.30: Morrisons online sample vs. LCF online 2016 - distribution of revenue by food category

	LCF online	Morr online	Morr online - LCF online
Bread and cereals	11%	15%	4%
Sugars and confectionary	11%	9%	-2%
Meat	19%	19%	0%
Fish and seafood	5%	4%	0%
Dairy and equivalents	13%	13%	0%
Fats	2%	2%	0%
Fruit and veg	21%	16%	-6%
Potatoes	1%	5%	4%
Non-alcoholic drinks	10%	10%	0%
Other	7%	6%	0%

Table 6.31: Morrisons online sample vs. LCF online 2017 - distribution of revenue by food category

	LCF online	Morr online	Morr online - LCF online
Bread and cereals	11%	14%	3%
Sugars and confectionary	11%	9%	-2%
Meat	18%	21%	3%
Fish and seafood	5%	5%	-1%
Dairy and equivalents	13%	13%	0%
Fats	3%	2%	0%
Fruit and veg	21%	16%	-5%
Potatoes	7%	5%	-2%
Non-alcoholic drinks	11%	10%	-1%
Other	1%	6%	5%

To assess whether the Morrisons online sample was representative of online grocery consumption at the national level in 2016 and 2017 (i.e. drawn from the ‘population at large’), a 1-sample χ^2 -goodness-of-fit test was performed with null hypotheses:

H_{06.3}: The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2016.

H_{06.4}: The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2017.

Table 6.32: LCF online vs. Morrisons online χ^2 goodness-of-fit test for 2016 and 2017

	2016	2017
df	9	9
α	0.01	0.01
χ^2 - crit	21.66	21.66
χ^2	1.45 << χ^2 - crit	21.38 < χ^2 - crit
p-value	0.99	0.01
Interpretation	No evidence to reject H_{06.3}	No evidence to reject H_{06.4}

The results of the 1-sample χ^2 -goodness-of-fit tests (Table 6.32) indicate that there is insufficient evidence to reject the null hypotheses. The Morrisons online sample is not significantly different to the LCF online sample in either 2016 or 2017. However, p-value was much lower in 2017 at 0.01, indicating that the samples may be diverging over time. To improve the alignment of the Morrisons online sample and LCF online sample, geographical reweighting was performed.

Reweighted by geographic distribution

As shown in [Table 6.33](#) there was evidence of bias in the location of the shoppers in the Morrisons sample.

Table 6.33: Geographic distribution of Morrisons' online consumers and online consumers nationally relative to GSS regions

	Morrisons	LCF	Morrisons-LCF
East Midlands	13%	7%	+6%
East of England	6%	10%	-4%
London	17%	13%	+4%
North East	1%	4%	-4%
North West	13%	11%	+1%
South East	7%	14%	-6%
South West	6%	9%	-3%
West Midlands	17%	9%	+8%
Yorkshire and The Humber	19%	9%	+10%
Wales	2%	5%	-3%
Scotland	0%	9%	-9%

Following the geographical reweighting, the 1-sample χ^2 goodness-of-fit tests were repeated with null hypotheses:

H_{06.5}: The proportion of revenue attributed to each food category was the same among the geographically reweighted Morrisons online sample as among the LCF online sample in 2016.

H_{06.6}: The proportion of revenue attributed to each food category was the same among the geographically reweighted Morrisons online sample as among the LCF online sample in 2017.

Table 6.34: Morrisons online sample vs. LCF online 2016 - distribution of revenue by food category (with geographical re-weighting)

	2016	2017
df	9	9
α	0.01	0.01
χ^2 - crit	21.66	21.66
χ^2	0.22 << χ^2 - crit	3.13 << χ^2 - crit
p-value	0.99	0.96
Interpretation	No evidence to reject H_{06.5}	No evidence to reject H_{06.6}

The results of the 1-sample χ^2 goodness-of-fit tests ([Table 6.34](#)) show that the reweighted Morrisons' online samples mimic the national online sample more closely, with similar p-values and χ^2 test statistics much lower than the critical values at the $\alpha=1\%$ level.

6.6.3 Do customers prefer to shop for fresh produce offline?

It is often reported that online grocery shopping is unsuitable for purchasing fresh produce due to the delay in delivering goods to the consumer and the fact customers cannot pick their own perishable products ([Kestenbaum, 2017](#); [Marino, 2015](#)).

Table 6.35: Proportion of 'fruit and veg' revenue attributed to fresh products

	LCF offline	LCF online	Morrisons online
2016	75.6%	76.2%	77.2%
2017	75.5%	75.0%	77.4%

[Table 6.35](#) suggests that there was little difference in the proportion spending on fresh

‘fruit and veg’ relative to processed and frozen ‘fruit and veg’ between the online and offline samples. The proportion of revenue spent on fresh ‘fruit and veg’ was slightly higher among Morrisons’ online consumers than nationally.

Summary of results

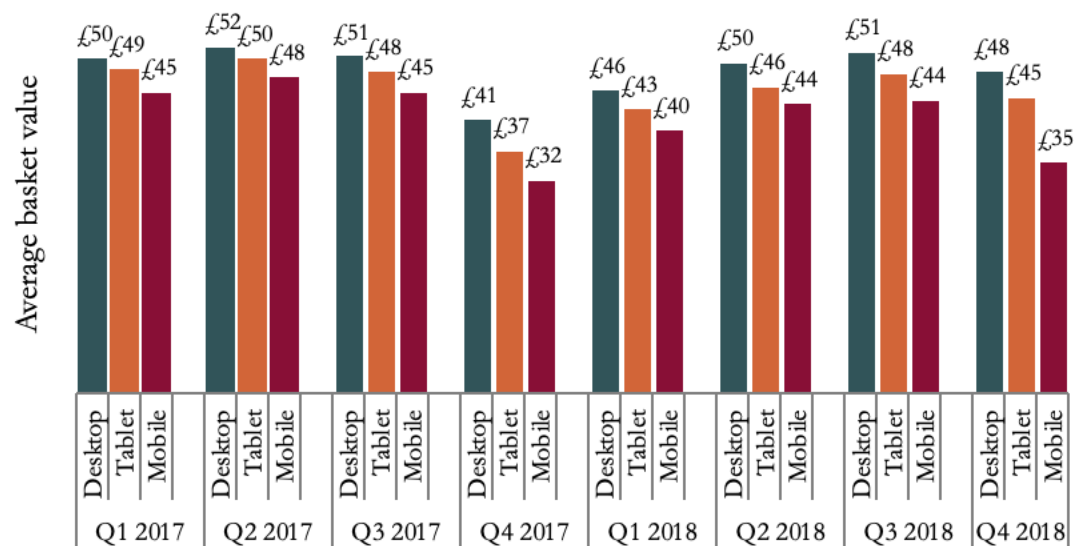
Hypothesis 6: Basket composition is the same online and offline

- At the national level, the composition of online and offline grocery spending by food category is significantly different.
- Nationally, consumers spend less on meat and ‘sugars and confectionary’ online than offline
- The Morrisons online sample was not significantly different from the LCF online sample signifying that the Morrisons sample has potential to be generalised to the national level.
- Reweighting the Morrisons’ online sample to match the LCF online sample improved the alignment of the Morrisons’ online sample and online spending at the national level.
- Looking at expenditure on fresh ‘fruit and veg’ compared to processed and frozen ‘fruit and veg’ at the national level indicated that there was little difference between the online and offline samples.
- More than three quarters of spending on ‘fruit and veg’ was spent on fresh produce online and offline at the national level.
- Among the Morrisons’ online sample, the proportion of spending on fresh ‘fruit and veg’ was slightly higher than nationally.

6.7 Hypothesis 7: Device and screen-size do not affect average basket size

6.7.1 Basket value by device type and display size

Figure 6.17: Mean average basket value by device Q1 2017 to Q4 2018



The mean average basket value was highest on desktop devices and lowest on mobile devices for every quarter of 2017 and 2018. Q1 and Q2 2018 were down for all devices on Q1 and Q2 2017, but Q4 2018 saw higher average basket values for all devices than Q4 2017 ([Figure 6.17](#)).

To test whether the differences in average spend by device were statistically significant, the following hypothesis was proposed:

H_{07.1} The average basket value was not statistically different among desktop, tablet and mobile purchases, i.e. ($\mu_{\text{Desktop}} = \mu_{\text{Tablet}} = \mu_{\text{Mobile}}$)

There was statistically significant heteroskedacity (unequal variance) among the desktop, tablet and mobile samples (Levene, $p < .01$). However, the ratio of variances suggested that the one-way ANOVA would remain a robust measure of the equivalence of mean basket value among devices (Kirk, 1995).

F-one-way Result (statistic=849.49, pvalue=<.01)

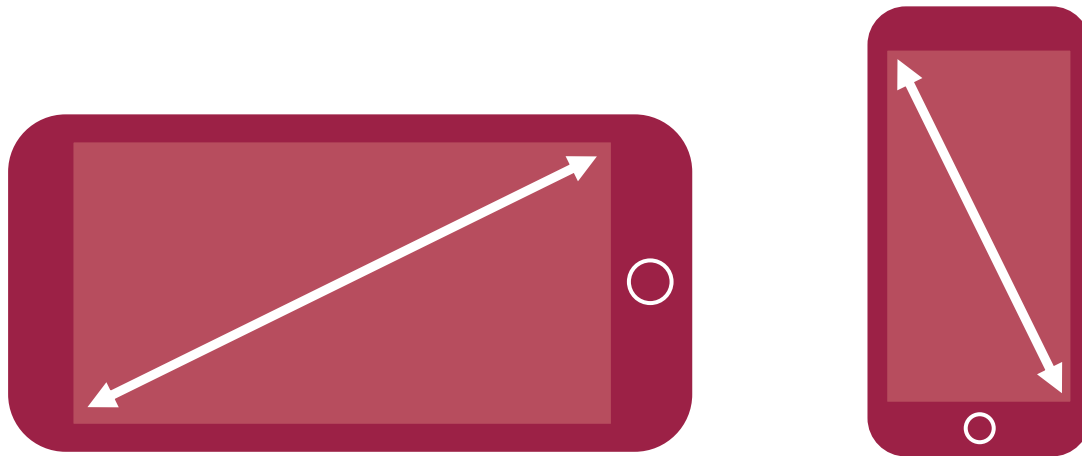
To determine whether the pairwise differences were significant a Tukey HSD test was performed, with $\alpha=1\%$. The results shown in Table 6.36 show that all devices are significantly different from one another and that the mean average basket value among desktop transactions > tablet transactions > mobile transactions.

Table 6.36: Multiple Comparison of Means - Tukey HSD, FWER=0.05

Group 1	Group 2	Mean difference ($\mu_2 - \mu_1$)	Reject $H_{07.1}$
Desktop	Mobile	-5.90	True
Desktop	Tablet	-3.42	True
Mobile	Tablet	2.48	True

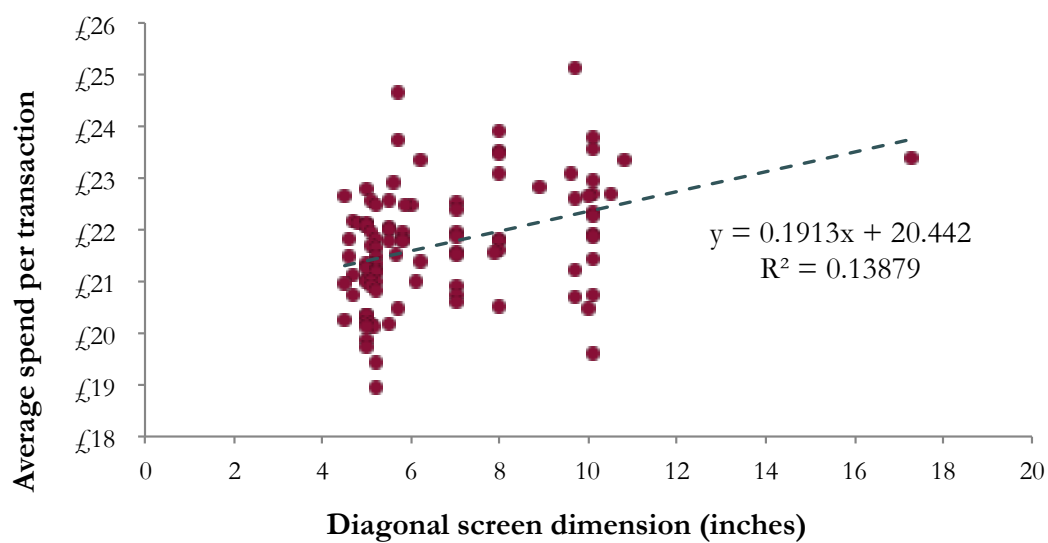
The results suggest that the size of the screen size plays a role in the average basket value.

Figure 6.18: Device display size is the maximal distance in inches from one edge of the device display to the other (diagonal screen size)



Looking in detail at the average basket size and screen size shows that there is no significant association – i.e. that the average spend on a 4” mobile device is not significantly different from on an 11.5” tablet ([Figure 6.19](#)).

Figure 6.19: Device display size is the maximal distance in inches from one edge of the device display to the other (diagonal screen size)



Whilst the two highest grossing devices were the Apple iPad and Apple iPhone, Samsung devices dominated among those spending most per transaction ([Table 6.37](#)).

Table 6.37: Summary of devices with highest average spend

Device info	Diag. screen dimension (inches)	Average spend per transaction
Samsung SM-T555 Galaxy Tab A 9.7	9.7	£25.15
Samsung SM-N9005 Galaxy Note 3	5.7	£24.64
Samsung SM-N950F Galaxy Note8	8	£23.92
Samsung SM-T585 Galaxy Tab A 10.1	10.1	£23.78
Samsung SM-G928F Galaxy S6 Edge Plus	5.7	£23.72
Lenovo YT3-X50F Yoga Tab 3	10.1	£23.55
Samsung SM-T310 Galaxy Tab 3 8.0	8	£23.53
Samsung SM-T533 Galaxy Tab 4 8.0	8	£23.46
Lenovo TB-X103F	17.3	£23.38
Microsoft Windows RT Tablet	10.8	£23.35
Samsung SM-G965F Galaxy S9+	6.2	£23.34
Samsung SM-T560 Galaxy Tab E	9.6	£23.09
Huawei KOB-L09 MediaPad T3 8.0	8	£23.08
Lenovo TB2-X30F TAB 2 A10-30	10.1	£22.97
Samsung SM-A530F Galaxy A8 2018	5.6	£22.90
Amazon KFJWI Kindle Fire HD 8.9	8.9	£22.83
Google Pixel 2	5	£22.80
Samsung SM-T800 Galaxy Tab S 10.5	10.5	£22.71
Samsung SM-T580 Galaxy Tab A 10.1	10.1	£22.69

Summary of results

Hypothesis 7: Device type and display size does not affect average basket size

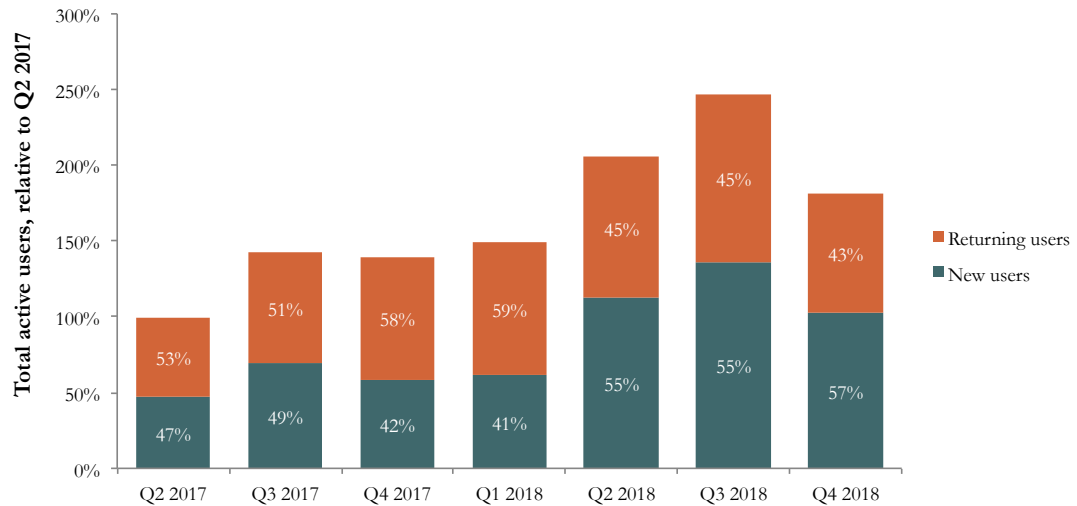
- In general average spend on desktop > tablet > mobile
- Among tablet and mobile devices this was not a linear relationship, depending more on brand than screen size. This may relate in part to the resolution of the screen and quality of the interface on these devices, or may reflect a less tangible effect, such as the social desirability of a particular device correlating with propensity to spend online.

6.8 Hypothesis 8: Online consumers are disloyal

6.8.1 What proportion of Morrisons' consumer-base are 'returning customers'?

[Figure 6.20](#) shows that in Q2 2017, just over half of the consumer-base were returning customers. The proportion has fallen over 2018, although this primarily reflects the upsurge in total active users. The number of active users per quarter nearly double between 2017 and 2018. An alternative model of 'loyalty' was therefore proposed.

Figure 6.20: Number of active customers by quarter (new and returning), 2017-2018



6.8.2 How loyal are Morrisons' online consumers?

A sample of 280k users was extracted from the Morrisons online dataset. The sample comprised users that had transacted at some point between Q1 2017 and Q2 2018.

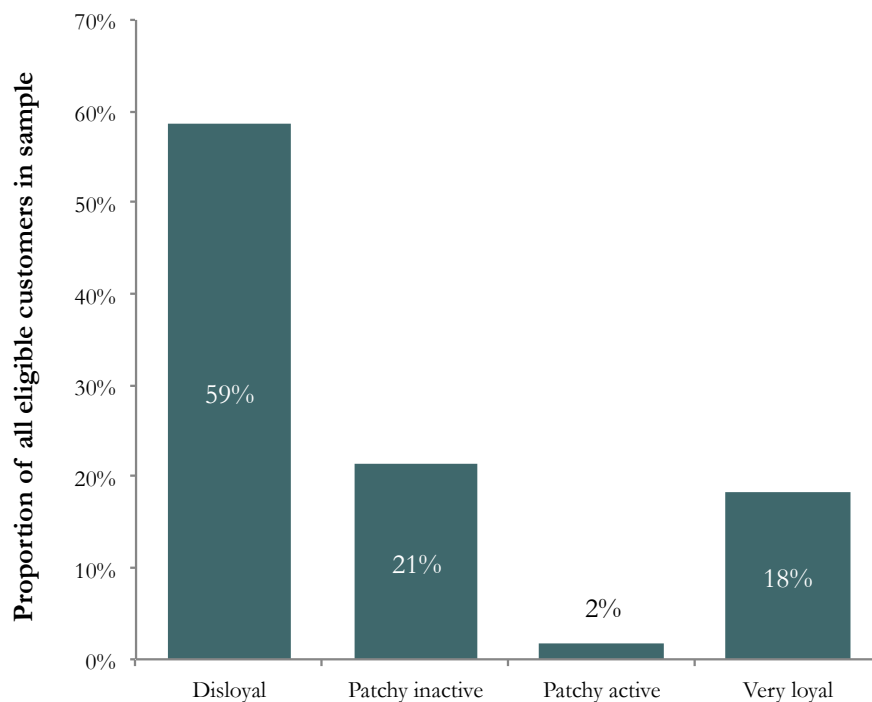
These users were then categorised by their loyalty level as follows:

- **Disloyal:** Those stopped being active, hadn't returned by Q2 2018 and weren't active in Q3 2018

- **Patchy inactive:** Those who have had patch loyalty and were not active in Q3 2018
- **Patchy active:** Those who have had patchy loyalty but were active in Q3 2018
- **Very loyal:** Those who were active every quarter since they first transacted (and for at least 2 quarters including Q3 2018)

[Figure 6.21](#) shows that around a fifth of Morrisons users have been ‘very loyal’. The majority of users were ‘disloyal’, in that they had made a transaction but had not made a transaction for at least six months by Q4 2018.

Figure 6.21: Sample consumers by loyalty level



Summary of results

Hypothesis 8: Consumers are disloyal

- Analysis of a sample of ~280k of Morrisons' online consumers indicates that the majority of consumers are disloyal, but that Morrisons has established core of loyal customers. The overall number of active customers also grew significantly between 2017 and 2018, dipping at Christmas 2018.
- Around a fifth of Morrisons consumers have been consistently loyal over 2017 and 2018 – shopping in every quarter since they made their first transaction.
- Each quarter between Q2 2017 and Q4 2018, around half of Morrisons' active online users were 'returning customers'.
- Of customers who made at least one transaction between Q1 2017 and Q2 2018, 59% did not transact in the six months to Q4 2018.

6.9 Summary of results in quantitative phase

Table 6.38: Summary of quantitative results from Sections 6.1-6.8

Null hypothesis	Test	p-value / result	Interpretation
H1: “Online is going well”	-	-	Fail to reject H1 <ul style="list-style-type: none"> Initial financial indicators suggest that Morrisons’ firm performance since online inception has been strong. Despite this, operating profits and firm value remain lower than in 2013, prior to the loss-making years of 2014 and 2015. Further improvements in operating profit will require increasing revenue whilst maintaining the recent gains made from reduced administrative expenses. Morrisons’ capacity to sustain improvements reside in their ability to manage the relationship with Ocado efficiently; and in expanding the consumer base or making online customers more valuable than offline customers to mitigate the risk of market cannibalisation. This will be challenging given the high price-competition still dominating the UK’s grocery market.
H2: The demographic composition of online consumers is broadly similar to offline consumers	-	-	Evidence to reject H2 <i>Social grouping</i>

			<p>The proportion of Morrisons’ consumers belonging to the more affluent ‘ABC1’ grouping was nearly 16 percentage points higher among online customers in 2016.</p> <p><i>Gender</i></p> <p>The proportion of female customers among Morrisons’ offline consumer-base was estimated to be just over half in 2016. By Q4 2017, 90% of Morrisons’ online consumer-base were reported to be female.</p> <p><i>Age</i></p> <p>The proportion of Morrisons’ online consumers in the 25-39 age band was nearly 20 percentage points higher than among the ‘offline’ YouGov survey participants. Despite this, the 18-24 age group was the most underrepresented – just 2.7% of Morrisons’ online audience and around 8% of its offline audience were in this age bracket.</p> <p><i>Location</i></p> <p>The location of consumers has changed since inception, in line with the increased coverage of Morrisons’ online service. Despite this, the majority of customers remain in Morrisons’ offline ‘heartlands’ of Yorkshire and the North East.</p>
H3: Online consumers are price-sensitive	-	-	<p>Evidence to reject H3</p> <ul style="list-style-type: none">• The vast majority (around 90%) of ‘net product adds to basket’ among Morrisons’ customers emanated from ‘price-insensitive’ online behaviours. There is also little evidence that consumers are becoming more price-sensitive in-terms of their on-site behaviour.• There is some evidence that Morrisons online consumers spend less than online consumers nationally.• There is some evidence that new or transient Morrisons consumers spend less per transaction than established long-term users.• There is some evidence that the average basket value is falling over time, although analysis of the long-term users suggests

	<p>that existing users’ basket values are not changing over time (except due to seasonal fluctuations).</p> <ul style="list-style-type: none">• Broadly speaking, the average basket size appears to ‘hug’ the minimum order value of £40 among established and transient Morrisons’ customers.
<p>H4: Online consumers are ‘time-poor’</p>	<p>Evidence to reject H4</p> <ul style="list-style-type: none">• Consumers spent significantly more time per transaction in 2018 than 2017.• the average time-on-site per transaction for multi-day shoppers was higher than for one-day shoppers.• the time-on-site per transaction for one-day shoppers in 2018 was lower than the time-on-site per transaction for one-day shoppers in 2017.• time-on-site per transaction per day for multi-day shoppers in 2018 was lower than the time-on-site per transaction per day for multi-day shoppers in 2017.• In 2017, 11% of product adds to basket originated from time-poor behaviours; and an even smaller proportion, just 3% in 2018 (Table 6.22).

H04.1 'Time-on-site per transaction' in 2017 was not statistically different from 'time on site per transaction' in 2018.	Mann-Whitney U-test Difference in medians confidence interval	<.01 99% CI [2.4,4.4]	Some evidence to reject H04.1 and accept alternative hypothesis: <ul style="list-style-type: none"> HA4.1 'Time-on-site per transaction' in 2017 was statistically less than 'time on site per transaction' in 2018. The confidence interval around the difference in medians between 2017 and 2018 suggest that the increase in time on site per transaction was only a few minutes.
H04.2 'Time on site per transaction' for one-day shoppers was not statistically different to 'time on site per transaction' for multi-day shoppers.	Mann-Whitney U-test Difference in medians confidence interval	<.01 99% CI [62.7,64.4]	Evidence to reject H04.2 and accept alternative hypothesis <ul style="list-style-type: none"> HA4.2 'Time-on-site per transaction' for one-day shoppers was statistically less than 'time on site per transaction' for multi-day shoppers. The difference in medians between the one-day and multi-day shoppers amounted to over an hour, supporting the finding that shoppers who transact multiple times over a number of days spend more time on their shop than those who transact once.
H04.3 'Time on site per transaction per day' for one-day shoppers was not statistically different to 'time on site per transaction per day' for multi-day shoppers.	Mann-Whitney U-test Difference in medians confidence interval	<.01 99% CI [1.5, 2.2]	Some evidence to reject H04.3 <ul style="list-style-type: none"> H04.3 'Time on site per transaction per day' for one-day shoppers was statistically more than 'time on site per transaction per day' for multi-day shoppers. Despite there being a statistically significant difference between the median times, the difference was small at around two minutes - the results suggest that multi-day shoppers spend almost as much time per day of their multi-day transaction as one-day shoppers do in total.
H04.4 'Time on site per transaction' for one-day shoppers in 2017 was not statistically different to 'time on site per transaction' for one-day shoppers in 2018.	Mann-Whitney U-test Difference in medians	<.01 99% CI [6.6, 8.4]	Evidence to reject H04.4 and accept the alternative hypothesis: <ul style="list-style-type: none"> HA4.4 'Time on site per transaction' for one-day shoppers in 2018 was less than 'time on site per transaction' for one-day shoppers in 2017.

	confidence interval		<ul style="list-style-type: none"> There is moderate evidence that the time on-site per day for one-day transactions decreased between 2017 and 2018 with the median time on site decreasing by around seven minutes.
<p>H04.5 ‘Time on site per transaction per day’ for multi-day shoppers in 2017 was not statistically different from ‘time on site per transaction’ for multi-day shoppers in 2018.</p>	<p>Mann-Whitney U-test</p> <p>Difference in medians confidence interval</p>	<p><.01</p> <p>99% CI [10.2, 13.0]</p>	<p>Sufficient evidence to reject H04.5 and accept the alternative hypothesis:</p> <ul style="list-style-type: none"> HA4.5 ‘Time on site per transaction per day’ for multi-day shoppers in 2018 was statistically lower than ‘time on site per transaction’ for multi-day shoppers in 2017. The time per transaction per day for multi-day shoppers decreased by around ten minutes between 2017 and 2018.
<p>H5: It is difficult to disrupt online baskets</p>	-	-	<p>Inconclusive, fail to reject</p> <ul style="list-style-type: none"> The average basket value has stabilised since Morrisons’ online inception, but shows seasonal fluctuations with the least spent per transaction at Christmas. Around half of all products added to basket emanate from ‘stable’ on-site behaviours such as engagement with previous orders and ‘favourites’ lists. There has been a shift in on-site behaviour with respect to ‘unstable’ product adds to basket. Consumers were much more likely to populate their baskets from search results rather than by using the product catalogue or clicking on offers in 2018 than in 2017.

H6: Basket composition is the same online and offline

Evidence to reject H6

- At the national level, the composition of online and offline grocery spending by food category is significantly different.
- Nationally, consumers spend less on meat and 'sugars and confectionary' online than offline
- The Morrisons online sample was not significantly different from the LCF online sample signifying that the Morrisons sample has potential to be generalised to the national level.
- Re-weighting the Morrisons' online sample to match the LCF online sample improved the alignment of the Morrisons' online sample and online spending at the national level.
- Looking at expenditure on fresh 'fruit and veg' compared to processed and frozen 'fruit and veg' at the national level indicated that there was little difference between the online and offline samples.
- More than three quarters of spending on 'fruit and veg' was spent on fresh produce online and offline at the national level.
- Among the Morrisons' online sample, the proportion of spending on fresh 'fruit and veg' was slightly higher than nationally.

H06.1: Channel of purchase was independent of basket composition by food category in the UK in 2016.

χ^2 test of independence

<.01

Sufficient evidence to reject

H06.2: Channel of purchase and basket composition by food category was independent in the UK in 2017.

χ^2 test of independence

<.01

Sufficient evidence to reject

H06.3: The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2016.

χ^2 goodness-of-fit test

0.99

Insufficient evidence to reject

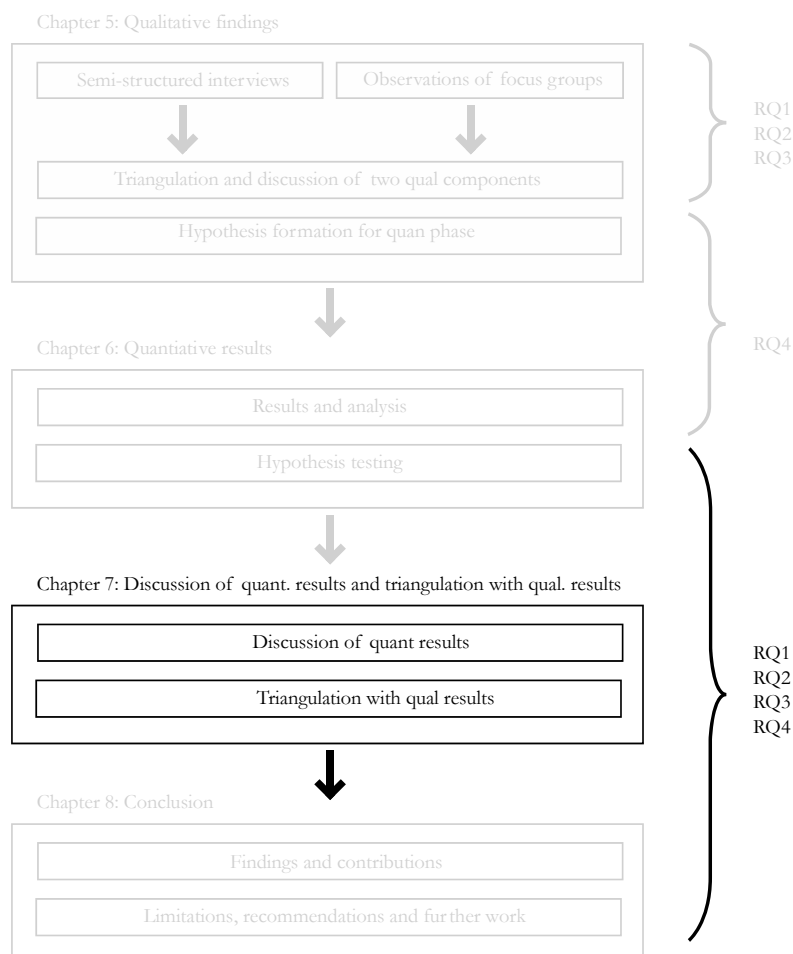
H06.4: The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2017.	χ^2 goodness-of-fit test	0.01	Insufficient evidence to reject H06.4 at the 1% level
H06.5: The proportion of revenue attributed to each food category was the same among the geographically reweighted Morrisons online sample as among the LCF online sample in 2016.	χ^2 goodness-of-fit test	0.99	Insufficient evidence to reject
H06.6: The proportion of revenue attributed to each food category was the same among the geographically reweighted Morrisons online sample as among the LCF online sample in 2017.	χ^2 goodness-of-fit test	0.96	Insufficient evidence to reject
<hr/>			
H7: Device and screen-size do not affect average basket size			<ul style="list-style-type: none"> • In general average spend on desktop > tablet > mobile • Among tablet and mobile devices this was not a linear relationship, depending more on brand than screen size. This may relate in part to the resolution of the screen and quality of the interface on these devices, or may reflect a less tangible effect, such as the social desirability of a particular device correlating with propensity to spend online.
H07.1: The average basket value was not statistically different among desktop, tablet and mobile purchases, i.e. ($\mu_{\text{Desktop}} = \mu_{\text{Tablet}} = \mu_{\text{Mobile}}$)	Multiple Comparison of Means - Tukey HSD	<.01	Sufficient evidence to reject H07.1 and accept the alternative hypothesis:

<div><div>H8: Consumers are disloyal</div><div>-</div><div>-</div><div>-</div></div>	<div><div><ul style="list-style-type: none">• The average basket value was statistically different on desktop, tablet and mobile devices.</div><div>Inconclusive, fail to reject<ul style="list-style-type: none">• Of customers who made at least one transaction between Q1 2017 and Q2 2018, 59% did not transact in the six months to Q4 2018.• Around a fifth of Morrisons consumers have been consistently loyal over 2017 and 2018 – shopping in every quarter since they made their first transaction.• Each quarter between Q2 2017 and Q4 2018, around half of Morrisons’ active online users were ‘returning customers’.</div></div>
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7. Discussion of quantitative results and triangulation with qualitative findings

This thesis explored the digital transformation of the UK's grocery market using an interdisciplinary web science, mixed-methods approach. Morrisons' late entry to the market was used as the central case study to explore the digital transformation of traditional retailers and their consumers.

Figure 7.1: Final research design – discussion of quant. results and triangulation with qual. findings



Recall the overall aim of this thesis:

How are traditional retailers and their consumers responding to the digital transformation of the UK's grocery shopping market?

Sections 7.1 to 7.4 discuss the findings of the four research questions underlying the central aim. Finally, the summary in [Table 7.5](#) shows how the findings from the qualitative and quantitative phases of this thesis build on and contrast with existing literature.

7.1 What are the drivers (and barriers) to entry in the UK's online grocery market? (RQ1)

The drivers and barriers to entry in the UK's online grocery market were examined through the late market entry of the UK's fourth largest supermarket, Morrisons. Interviews with seven of Morrisons' senior staff; a competitor; and a retail analyst revealed that the primary driver of Morrisons' late entry to the UK's online grocery market was defensive. The move was consumer-demand driven with Morrisons looking to defend their existing consumer base, to recapture customers lost to rivals and to maintain supplier terms.

At first glance, Morrisons' late market entry was consistent with their image as a traditional, risk-averse retailer and reminiscent of the findings of Mithas (2013) and DiMaggio and Powell (1983) – who observed that late entrants yield to normative pressure and imitate the market status quo. Where Morrisons' entry to market departed from existing literature was in its method of entry. Morrisons brokered an innovative relationship with Ocado – the market's leading technology and logistics firm. This allowed Morrisons to accelerate their market presence and avoid sinking significant costs into research and development. This revelation has implications for understanding digital transformation among 'late movers' and traditional firms since it evidences the

possibility of gaining competitive advantage. Morrisons' reticence to join the market and to embrace technological change may actually have enabled them to broker a relationship with Ocado that will enable it to outstrip competitors who made the investment in 'online' earlier.

The barriers to Morrisons' digital transformation resided primarily in a lack of financial incentives - including low profit margins, lower market share and market cannibalisation. These were common to all incumbents within the UK's online grocery market – and other markets as reported by Fuentelsaz et al (2015) and Mascarenhas (1992).

Fears around market cannibalisation were shown to be well-founded in the quantitative phase of this thesis. Despite rapidly expanding its delivery reach, the geographic distribution of Morrisons' consumer-base had not altered dramatically in the two years between 2016 and 2018 – and that the majority of its online consumers resided in its offline 'heartlands'. There was however evidence that the online revenue and operating profit of the firm had increased significantly over the same period.

Table 7.1: Codebook and findings for first order code: (barriers and) drivers – retailer / industry (partial reproduction of Table 5.2)

First order code	Emergent code	Key findings	Comparison with prev. lit.	
Barriers	<i>Retailer perspective</i>	Difficult to make online profitable	Agrees	Lack of financial incentives, e.g. Fuentelsaz et al (2015)
		Market coverage already close to 100% in UK		Lower market share and cannibalisation, e.g. Mascarenhas (1992)
		Market cannibalisation occurring	Disagrees	Cost saving, e.g. Bharadwaj et al (2013); Loebbecke; (2015)
Drivers	<i>Retailer perspective</i>	Defensive - to regain / protect consumer-base	Agrees	No financial incentives, e.g. Fuentelsaz et al (2015) Multi-channel spend more, e.g. Ansari et al (2008)

To attract a new demographic?
 Acceptance of longevity of online market
 Multi-channel customers higher value?

Disagrees

Spend depends on product category, e.g. Kushwaha and Shankar ([2013](#))

7.2 What strategic shifts occur when traditional supermarket retailers undergo digital transformation? (RQ2)

With respect to the strategic shifts occurring during the digital transformation of the UK's online grocery market (RQ2), this thesis responded to Matt et al's call for empirical examples to populate their 'four dimensions of digital transformation' but also proposed extensions to the model: a scale to measure the capacity to enact strategic change (see Section 7.2.1); and the addition of a fifth dimension of strategic change (see Section 7.2.2). It is also proposed that the model is reconfigured as a 'cycle of digital transformation'.

7.2.1 Capacity to enact strategic change – addition of a 'high to low' scale

This thesis proposed the use of a 'high to low' measure of the capacity of individual firms and the broader market to enact change in each of Matt et al's dimensions. This facilitates understanding of digital transformation in specific markets and then allows a richer understanding of the role of a specific firm within its market.

The high-low scale was designed to be a continuous spectrum, but to aid in its application, examples of the characteristic features of firms with high, medium and low capacity to enact Matt et al's dimensions of digital transformation are shown in [Table 7.2](#).

Table 7.2: Examples of high, medium and low capacity to enact change dimensions

	High	Low
<i>Financial aspects</i>	<p>Have shown sustained profits/increased revenue since adopting the technology.</p> <p>There is sufficient margin or inefficiency in the market for all firms to benefit; or to outperform competitors.</p>	<p>Sustained losses since adopting the technology.</p> <p>No evidence of profitability using the technology in other industries/among other firms.</p>
<i>Use of technology - attitude</i>	<p>History of engagement with technologies.</p> <p>Management committed to technology.</p>	<p>No history of engaging successfully with technological innovations.</p> <p>Little or no evidence of management's commitment to technology.</p>
<i>Use of technology - abilities</i>	<p>Dedicated technology team and skilled employees. May well be a frequent 'first adopter' in the market.</p>	<p>Little or no evidence of a technology dedicated team. May have actively rejected technological innovation in the past.</p>
<i>Distribution of agency</i>	<p>Power is transferred in favour of the retailer/firm due to the capacity or use of technology. This may be in the form of intelligence, increased demand, cost-saving, or other efficiencies.</p>	<p>Power is transferred in favour of the technology and/or consumer due to the capacity or use of technology.</p>
<i>Changes in value creation</i>	<p>Entering the market presents new value for consumers, this may be due to the capabilities of the technology itself, or due to innovation on the part of the firm.</p>	<p>Entering a market has little or no new value for consumers and the firm mimics existing retailers, offering nothing new.</p>
<i>Structural changes</i>	<p>Makes systemic changes to accommodate and make the most of the opportunities presented by a new technology.</p>	<p>Makes little or no effort to restructure company to accommodate or make the most of a new technology. May abandon technology in favour of changing management or operational structures.</p>

In the case of online grocery shopping it was proposed that as a whole, retailers undergoing digital transformation in the UK's grocery market have:

- **High** potential to **utilise technology** – Ocado have shown themselves to be the market leaders in terms of exploiting technology to optimise logistics and make the delivery of perishable items a viable option. Retailers such as Tesco have a long history of collecting and harnessing consumer data and online analytics extend the scope of this tracking and customisation.
- **Medium-high** potential to **create new value** – there is clear potential to add value to customers with online shopping – providing a convenient, cost effective door-to-door service with technological capabilities such as favourites baskets making the process easier for consumers.
- **High** potential to enact **structural change** – the re-structuring and digitisation required to integrate online into an incumbent firm's supply chain, logistics and stock management systems offers a substantial opportunity to restructure existing systems and processes.
- **Low** potential to benefit and transform **financially** – the logistical overheads of providing an online grocery service make turning a profit from this sector particularly challenging. Reticence among retailers to declare their online results is symptomatic of this challenging environment. Prior to 2014, only Tesco claim to have turned a profit online. Ocado's first profit making year coincided with other large deals including the service provision arrangement with Morrisons.

Looking specifically at Morrisons' digital transformation, it was noted that Morrisons deviated from the market average in all but one dimension. Generally, Morrisons' capacity to enact the dimensions was determined to be lower than the market due to their nascent technological expertise and late market entry. In the case of profitability however, it was shown that Morrisons has been effective in restructuring its

administrative costs and has seen year on year real revenue increases since launching its online offering.

7.2.2 ‘Distribution of agency’ – addition of a fifth dimension of digital transformation and conceptualising digital transformation as a cycle

A fifth dimension was proposed to encapsulate the redistribution of agency that occurs in a ‘social machine’ such as online grocery consumption. This dimension was termed ‘distribution of agency’ and considered the balance of power and nature of the relationship between consumer, technology and retailer; and the capacity of retailers to adapt to the new socio-technical environment. ‘Distribution of agency’ was used to show how power has shifted away from the traditional retailer in the online grocery market and to evaluate Morrisons’ capacity to adapt to this new relationship. Morrisons’ partnership with Ocado shows a capacity to ‘buy in’ expertise, but it is not yet clear whether they will be able to cultivate expertise in-house to make online a profitable endeavour. In other contexts, this fifth dimension will allow researchers to evaluate power shifts in other web and technology-enabled transformations but also forms an olive branch between management studies and the growing web science literature relating to social machines. The effect of the addition of the fifth dimension of strategic change can be seen in [Table 7.3](#). [Table 7.4](#) shows how the model of digital transformation could be used to characterise the UK’s online grocery market as a whole; late-mover Morrisons; first-mover Tesco; and pureplay entrant Ocado.

Table 7.3: Augmentation of Matt et al's four dimensions of digital transformation for Morrisons and the UK's online grocery market

Dimension	Capacity to enact dimension		Explanation
	Morrisons-specific	Market-specific	
<i>Financial aspects</i>	Low	Low	The industry as a whole has shown little evidence of the profitability of online grocery shopping. Morrisons' executives and employees were clear that the move online was not profit seeking but defensive - in order to slow the exodus of customers to competitors.
<i>Use of technologies</i>	Medium	High	<p>Use of technology includes the resources and capabilities to exploit technologies. Morrisons have embarked upon a cultural overhaul, including a condensing the executive board. The deal with Ocado is unprecedented in the industry, but also risk averse in terms of outsourcing to experts rather than developing in house.</p> <p>Despite the cultural overhaul, Morrisons remain inexperienced in online marketing and consumer analytics. Their leveraging of Ocado's expertise has facilitated their entry to market, but to benefit long-term, they will need to expand their skills to alter the distribution of agency in the market; and to create new value.</p>
<i>Distribution of agency</i>	Low	Medium	<p>Online grocery market is consumer demand driven. Consumers are able to leverage online technologies to readily compare products between retailers and now do less work – no longer travelling to the supermarket, processing products or transporting them.</p> <p>Morrisons' skillset as a traditional retailer constrained by interfacing with web-technologies and unfamiliarity with channel. They claim to be no longer 'technophobic' but have limited capacity and skills to make the most of the new communication and data-analytical opportunities. The deal with Ocado is an example of 'buying in' this expertise with respect to the logistics of home delivery.</p>

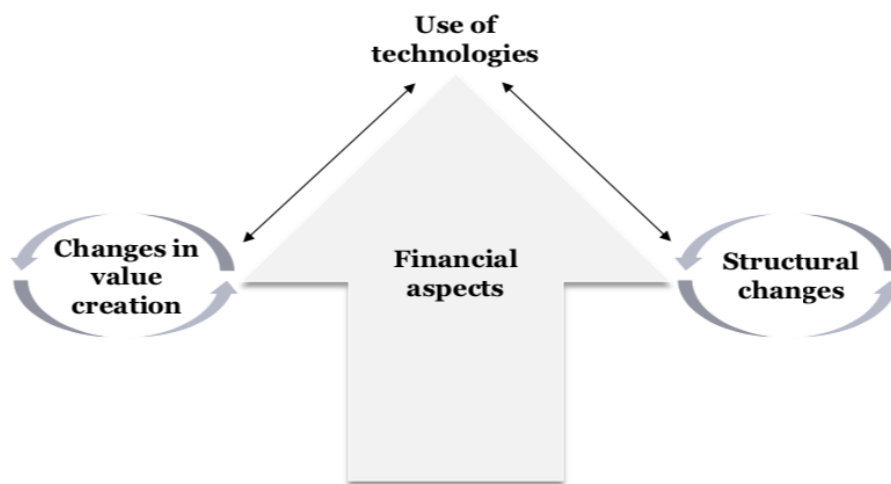
<i>Changes in value creation</i>	Medium	Medium – high among specialist retailers	Morrisons' executives, competitors and analysts alike were unable to pinpoint clear innovation in Morrisons' entry to market, except to offer Ocado's market-leading customer service at Morrisons' lower price point. More broadly, Morrisons online customers stand to benefit from the generally cited benefits of online including convenience and time-saving. The executive team did highlight the importance of maintaining skilled people (e.g. butchers) and managing their own supply chain and manufacturing - claiming this gave them a point of difference. It was acknowledged by a competitor that this was where Morrisons' core value-creation potential resided.
<i>Structural changes</i>	Medium	High	Leveraging Ocado's established and market leading hub and spoke model bodes well for Morrisons' offering. The integration of its supply chain and digitisation of stock ordering support this transition. However, the online offering has been siloed from offline offering. Morrisons have begun to use stores as 'spokes' to increase reach but there is no omnichannel offering at present.

Table 7.4: Example of an application of the digital transformation model to the UK's online grocery market; late-mover Morrisons; first-mover Tesco and pureplay entrant Ocado (reproduction of Table 5.6)

Dimension	Capacity to enact dimension			
	Market-specific	Morrisons	Tesco	Ocado
<i>Financial aspects</i>	Low	Low	Medium	Low-Medium
<i>Use of technology - attitude</i>	High	Medium	Medium-high	High
<i>Use of technology - abilities</i>	High	Medium-Low	Medium-High	High
<i>Distribution of agency</i>	Medium	Low	Medium-High	Medium
<i>Changes in value creation</i>	Medium – High among specialist retailers	Medium	High	High
<i>Structural changes</i>	High	Medium	Medium	Medium-High

The addition of the 'fifth dimension' and the high-low scale also provoke examination of Matt et al's 'framework of digital transformation'. Matt et al proposed a model where financial aspects were the primary 'bounding' feature of digital transformation, both driving and constraining the transformation. [Figure 7.2](#) shows how they conceptualised digital transformation, with financial aspects affecting the capacity to enact structural changes and value-creation. The dependencies between the four dimensions are less clear from the diagram.

Figure 7.2: Matt et al's digital transformation framework



As produced in Matt et al (2005)

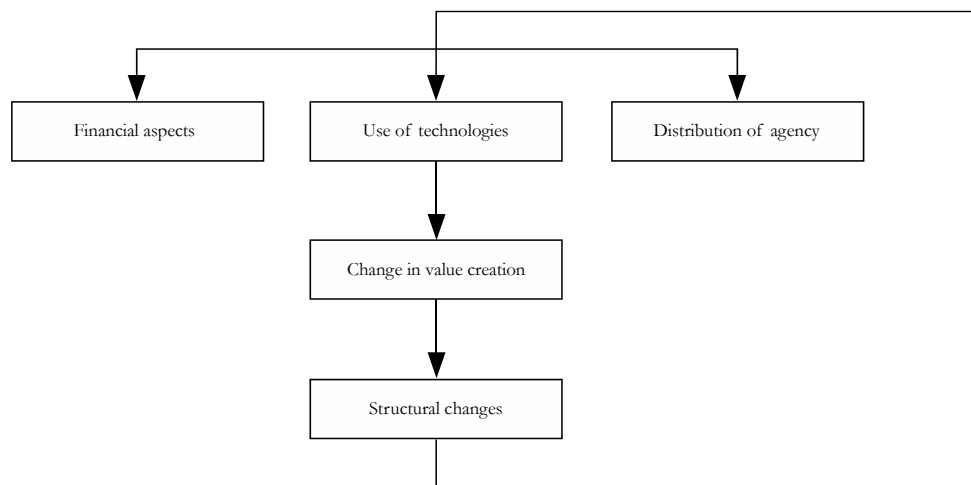
Reflecting on digital transformation as a continuous process, this thesis argues for a refinement of that conceptualisation as a 'cycle of digital transformation' ([Figure 7.3](#)). The success of the digital transformation can therefore be thought of in terms of the ability to keep this cycle in motion; whilst a failed digital transformation would see the breakdown of this cycle.

[Figure 7.3](#) shows how the 'Financial aspects' and 'Use of technologies' dimensions from Matt et al's framework form two of three 'bounding factors' in the digital transformation cycle. In agreement with Matt et al's model, financial factors have shown

themselves to be a further bounding force – either disincentivising entry to market; or presenting further opportunities to enter the market or expand market presence.

This thesis has argued for the addition of ‘distribution of agency’ as another bounding factor affecting the success of digital transformation. Together, these three bounding factors contribute to a company’s capacity to create changes in value creation and to embed these through structural changes to processes and operations. The success (or failure) of this value creation and structural change feeds back to the financial position of the company but also to the other two bounding factors.

Figure 7.3: Cycle of digital transformation – reworking of Matt et al’s framework



The high-low scale applied to each stage affects how quickly and effectively digital transformation occurs. Generally, a very low value in any bounding factor would prohibit the continuation of the cycle, although in each industry, some will form more of a bottle-neck than others. For example, if there is a huge market opportunity, a company may not need a lot of technological ability to benefit financially. In contrast, a low margin, highly saturated market such as grocery shopping may demand much higher technical skills for digital transformation to be financially viable.

7.3 What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market? (RQ3)

The first hypothesis of the quantitative phase of this thesis addressed the financial outcomes of Morrisons' digital transformation and entry into the UK's online grocery market. The hypothesis was drawn from the claim of a Morrisons' executive who expressed their opinion that 'online is going well'.

Grocery retailers are not required to (and have opted not to) report their online and offline performance separately in their financial accounts. This presented a challenge in trying to establish how Morrisons' online channel is performing relative to its peers. Looking at firm level performance, initial financial indicators suggest that Morrisons' firm performance since online inception has been strong - change in revenue over time indicates that revenue growth has been faster than the increase in food CPI since June 2016. It has also been shown that nominal revenue was higher than in the same month in the previous year since April 2016. At firm level, operating profit and operating profit margin have been market leading since 2015, primarily due to substantial decrease in administrative expenses since David Potts became the CEO. Despite this, operating profits and firm value remain lower than in 2013, prior to the loss-making years of 2014 and 2015. This is seen across the industry where intense price competition has seen firms 'race to the bottom' to compete with discounters. It was readily admitted by Morrisons' executives and employees that the move online was not profit seeking but defensive - in order to slow the exodus of customers to competitors. Furthermore, the industry as a whole has shown little evidence of the profitability of online grocery shopping. Further improvements in operating profit will require increasing revenue whilst maintaining the recent gains made from reduced administrative expenses.

Morrisons' capacity to sustain improvements reside in their ability to manage the relationship with Ocado efficiently; and in expanding the consumer base or making online customers more valuable than offline customers to mitigate the risk of market cannibalisation.

Time will tell whether Morrisons can sustain this momentum and make online a profitable channel. Evidence of Morrisons' capacity to achieve online profitability may reside in their ability to manage the demand and supply (dis)advantages of their online offering. Morrisons' biggest opportunities lie in increasing revenue by reaching a wider audience and recapturing lost customers and in using price differentiation to make more profit per sale online. The risks remain in the overhead costs of servicing online customers and the risk of 'cannibalising' the consumer base. This would need to be balanced with effective upselling to make converting an offline customer to an online customer worthwhile. The cost of partnering with Ocado may also be prohibitive to turning a profit, although the risk of sunk and wasted R&D costs is reduced by leveraging Ocado's market-leading technology.

In terms of the distribution of agency, this thesis argues that Morrisons will need to recapture some of the agency lost to the consumer and technologies in the online grocery market. Morrisons' historical identity as a risk-averse, low-tech firm makes engaging with the opportunities of online technologies more challenging. Their relationship with Ocado has allowed them to 'buy in' the logistical element of this, but the likes of Tesco and Amazon remain well ahead in terms of personalising the online experience and tracking consumer behaviour.

It was shown in Chapter 6 that the demographics of Morrisons' consumer base have changed since inception, but in terms of geographic shift this has not yet been substantial. This may be indicative of Morrisons' success in attracting new customers in all areas whilst expanding. However, it may reflect an inability to gain a foothold in areas

of the country where Morrisons doesn't have an offline presence. This is problematic, particularly if existing customers are being 'cannibalised' and serviced at a higher cost as online consumers. This risk contributes to the low-profit environment already predominated the UK's grocery market.

With strong firm level performance in recent years, being a market leader in this challenging environment may not be unrealistic if Morrisons were competing only with other traditional retailers. However, the entry of non-traditional competitors such as Amazon raises the stakes. Amazon has the potential to disrupt the online market in a similar fashion to Aldi and Lidl's' disruption of the offline market – they are able to provide a selection of goods at highly competitive prices but need not provide the whole suite of produce that consumers demand of traditional supermarkets. Morrisons has shown itself to be strategic in facing this new challenge – it has hedged its exposure to Amazon by becoming a supplier to Amazon's nascent online grocery presence in the UK.

7.4 Has the digital transformation of grocery shopping reconfigured consumer strategies? (RQ4)

7.4.1 Have the demographics of consumers changed since online inception?

Evidence from the YouGov survey and Google Analytic tracking of Morrisons' online consumer-base suggest that there have been changes in the demographic make-up of Morrisons' consumer base since online inception, most of which has resided in the reported gender and social grouping of customers. The proportion of Morrisons' consumers belonging to the more affluent 'ABC1' grouping was nearly 16 percentage points higher among online customers in 2016. By Q4 2018, 84% of Morrisons' online consumer base belonged to the ABC1 group, 68 percentage points higher than the

proportion of C2DE customers. These findings are consistent with Harris et al (2017), who reported that more affluent families with children were the most likely to be regular online shoppers.

In contrast to the findings of Bowlby et al (1997), McDowell (2007) and Kelloggs (2015), Morrisons' entry to the online grocery market has not seen a rebalancing of gender roles in grocery market. On the contrary, whilst the proportion of female customers among Morrisons' offline consumer-base was estimated to be just over half in 2016, the online population was nearly three-quarters female in 2016. This gap widened further over time such that by Q4 2017, 90% of Morrisons' online consumer-base were reported to be female. The reasons for this counter-intuitive finding are unclear. It is possible that previous studies and the suppositions of theorists have overestimated the gender-neutralising effect of online grocery shopping. Morrisons' online demographics are however more consistent with the findings of Hwong (2018). They reported that women predominated the 'heavy' online shopping, spending longer and more money online. Other features of online grocery shopping may also be having an impact on women's propensity to be the primary shopper. It was shown in the focus-groups with consumers that female respondents valued the ability to multi-task when engaging in online shopping. Rather than being constrained to dedicate an extended period of time to visiting a supermarket, respondents felt able to intersperse grocery shopping with other tasks. Other enabling features of online grocery shopping were alluded to by interview respondents. One respondent noted that online grocery shopping is 'disciplined' in that it is less susceptible to the 'pester power' of a child in the supermarket, consistent with the findings of Roberts (2017). This capacity to exhibit skill in being 'thrifty' may resonate with twenty-first century women as it did for twentieth-century women in physical stores.

Finally, the structure of the data collection process used by Google Analytics to estimate gender among Morrisons' online consumers may have a part to play. Gender and other demographics are estimated by Google by assessing users' search and activity history. Google may be overestimating the prevalence of female consumers or may be more reliably identifying female users whilst leaving male users 'untagged'.

The proportion of Morrisons' online consumers in the 25-39 age band was nearly 20 percentage points higher than among the 'offline' YouGov survey participants. This finding suggests that Morrisons has been successful in recruiting a younger demographic to its online offering, allaying some of the fears associated with its aging offline consumer-base. Despite this, the 18-24 age group was the most underrepresented – just 2.7% of Morrisons' online audience and around 8% of its offline audience were in this age bracket. The low penetration among younger users is consistent with the reports of Hwong (2018). Consumers in the middle two bands (25-39 and 40-54) constituted 80% of the consumer base, with the remaining customers belonging to the 55+ age group.

The disparity between the geolocation of Morrisons' online and offline consumer-base reflected the reach of Morrisons' online offering in 2016. The proportion of online consumers located in the Midlands was 22 percentage points higher than offline in 2016. Despite the geographic expansion of the service over 2017 and 2018, the location of consumers has not changed drastically since online inception. The digital director of Morrisons thought that the change in the overall consumer demographic mirrored the extending reach of Morrisons' online offering. This has been partially realised in the demographics of consumers - there has been a slight increase in the proportion of consumers located in London and the South East since online inception, whilst the proportion in Yorkshire and Midlands has fallen. Furthermore, the proportion of more affluent users has increased alongside an increase of London customers (where the concentration of ABC1 affluent customers is greatest).

7.4.2 Are Morrisons' online grocery shoppers' price-sensitive?

Despite consistent claims from Morrisons' executives to the contrary, this thesis found little evidence of Morrisons' consumers being highly price sensitive, or increasingly price-sensitive over time. Less than 10% of products were added to basket from 'price-sensitive' online behaviour in 2017 (such as offers and sorting products by ascending price). In 2018, less than 7% of product adds to basket were from price-sensitive behaviours. This is consistent with the findings of Degeratu et al (2000), but doesn't support the claims of Roberts (2017), Morrisons' employees and Wang et al (2015). It also appears to be a departure from Miller's offline assertion that shopping done on behalf of the household is governed by thrift. Several focus group respondents expressed that speed and convenience were more important to them than engaging with offers. Whilst this thesis did not find much evidence of 'thrift', the reports that the online shop is more disciplined and that it is easier to resist treat items was shown in the basket composition of Morrisons' customers and customers nationally. The proportion of the basket comprising sugars and confectionary was significantly lower online.

Focus group respondents tended not to focus on desiring 'cheap' products, but instead referred consistently to 'value'. Focus group respondents from London were particularly keen that the website offered good value but didn't "look budget". This desire for modernity alongside value seemingly reflects the importance of maintaining an identity of relative affluence, whilst also achieving good value, akin to the skill exhibited by housewives doing self-service shopping for the first time in the 1950s and 60s.

Despite little overall evidence of 'price-sensitive' browsing behaviours among Morrisons' customers, there is some evidence that Morrisons online consumers spend slightly less than online consumers nationally. This is not totally unexpected, since Morrisons' markets itself as 'value' option relative to the likes of Ocado and Waitrose. There was also some evidence that newer or transient Morrisons consumers spend less

than established long-term users and that the average basket value is therefore falling over time. This is interesting given that the demographics of the consumer-base has become increasingly 'affluent' since Morrisons' online inception. Analysis of the long-term users suggests that existing users' basket values are not changing over time (except due to seasonal fluctuations). This contrasts with Wang et al (2015), who found that mobile customers spend more over time. Consumers were much less likely to shop online at Morrisons over the Christmas period and basket sizes were generally smaller over this period too. This may be due to needing to book a Christmas delivery well in advance, or as one focus group respondent suggested, customers just prefer to shop in-store at Christmas – a time when they are happier abandon thrift and shop for things they usually would not.

In summary, Morrisons' online consumers do not appear to be engaging in highly price-sensitive online behaviours and average basket values are not dissimilar from those at the national level. Customers are much more likely to be swayed by the speed and convenience of online more than how cheap it is. There was however evidence of a lower tendency to buy 'treat' products in the sugars and confectionary food category – consistent with claims that the online shop is more disciplined.

7.4.3 Are Morrisons' online grocery shoppers time-poor?

Morrisons' executives and focus group respondents were almost unanimous in citing time-saving as a key motivation for shopping online. Focus group respondents cited high reliance on 'favourites', concurring with the Robinson (2007), who found that regular shoppers had reduced their shop time to minutes, facilitated by features such as 'favourites'. Despite these assertions, this thesis has shown that among Morrisons' consumers the time on-site per transaction was higher in 2018 than 2017, suggesting that Morrisons' consumer-base are becoming less time-poor over time. Michaud Trevinal (2014) has suggested that this is consistent with consumers multi-tasking and therefore completing their shopping over an extended period. Analysis of the practices

reported by focus group respondents supports this – suggesting that the ‘perception’ of saving time and interspersing shopping with other activities were more important to customers than absolute time-saving.

Among the Morrisons’ customers, it was found that the most time-efficient orders are placed by those who complete the transaction over a single day. Compared to offline shopping times, the ~20 minute median for one-day transactions does likely reflect a time-saving compared to offline shopping. This constituted around a third of transactions in 2017 but just a quarter in 2018. Surprisingly, consumers who edited their orders over a number of days not only spend more time in total on their order, but also spent a similar amount of time per day editing their basket. For multi-day orders, the median of ~1.2 hours is probably similar or longer than an average offline weekly shop. For these users, other factors such as convenience and the ability to edit the basket over a number of days may play a bigger role.

The proportion of transactions conducted over one was day lower in 2018 than 2017. In 2017, 35% of tracked orders were completed over a single day. In 2018, this figure was 23%. This provides further support for the suggestion that Morrisons’ users are becoming less time-efficient and spending more days (and more time) on their transactions as time goes on. Despite this, the average time per transaction per day among the multi-day shoppers was lower in 2018 than 2017, perhaps reflecting the use of pre-saved favourites speeding up the shop.

7.4.4. Do consumers shop for the same things online and offline?

To establish whether consumers shop for the same things online and offline, the thesis began by comparing the spend per household per week by food category at the national level using the results of the Living Costs and Food survey (LCF). This showed that online and offline grocery spending by food category was significantly different.

Nationally, consumers spend less on meat and 'sugars and confectionary' online than offline. It was next shown that the Morrisons online sample was not significantly different from the LCF online sample signifying that the Morrisons sample has potential to be generalised to the national level. Reweighting the Morrisons' online sample to match the LCF online sample improved the alignment of the Morrisons' online sample and online spending at the national level further.

It was asserted by several focus group respondents that they felt uneasy about shopping for fresh produce online due to not being able to select the best items. One respondent remarked that this was a 'woman's thing' to exhibit skill in selecting the best produce. This resonated with the findings of Hand et al ([2009](#)), who found that this, along with a fear of substitutions deterred buying fresh produce online. This was not consistent with the findings of the LCF or examination of Morrisons consumer data however. Looking at expenditure on fresh 'fruit and veg' compared to processed and frozen 'fruit and veg' at the national level indicated that there was little difference between the online and offline samples. This result supports the findings of Degeratu et al ([2000](#)), but is contrary to popular wisdom that customers are reluctant to shop for fresh produce online ([Kestenbaum, 2017](#); [Marino, 2015](#)). Furthermore, more than three quarters of spending on 'fruit and veg' was spent on fresh produce online and offline at the national level. Among the Morrisons' online sample, the proportion of spending on fresh 'fruit and veg' was slightly higher than nationally. Morrisons' executives cited Ocado's 'industry-low substitutions' as a key reason for leveraging their infrastructure. The higher than national expenditure on fresh 'fruit and veg' among Morrisons' online customers suggests that Morrisons have been able to reassure customers that fresh produce can be purchased online. This may suggest an erosion of skill on the part of the customer – no longer needed to select the freshest produce – or a shift in this skill to that of providing efficiently for the household without loss of quality-time with loved ones.

7.4.5 Basket stability

As discussed in Section 7.2.3, the average basket value has stabilised since Morrisons' online inception, but shows seasonal fluctuations with the least spent per transaction at Christmas. In terms of basket composition, around half of all products added to basket emanate from 'stable' on-site behaviours such as engagement with previous orders and 'favourites' lists. Several focus group respondents mentioned the utility they derived from favourites. They remarked that grocery shopping is boring and time-consuming and that favourites can be used as a 'template' which can be tweaked as necessary.

Despite focus group respondents reporting high reliance on favourites and previous orders, around half of product adds came from 'unstable' behaviours such as search, browsing the product catalogue and engaging with latest offers. There was shift in on-site behaviour with respect to 'unstable' product adds to basket among Morrisons consumers between 2017 and 2018. Product adds to basket emanating from search results constituted 46.4% of all net product adds in 2017, but this rose to 61.4% in 2018. This preference for search among Morrisons' consumers in 2018 concords with the findings of Anesbury et al ([2016](#)). As one Morrisons' executive remarked, this presents a challenge to the retailer (in that consumers are inclined to ignore the online store layout and head straight for the search bar). However, this trend also offers an opportunity for Morrisons to engage with the user and rebalance some of the 'lost agency' in the new online relationship. The free-text search box can be harvested to understand what consumers really want to find and how they look for it – a resource that could be invaluable if used effectively by retailers to improve stock control and new product releases.

7.4.6 Does device type or screen-size affect Morrisons' average basket value?

In general, this thesis found that the average basket value among Morrisons' desktop transactions was higher than among its tablet transactions, which in turn were higher than among its mobile transactions. This appears to be consistent with Maity's 'media richness' hypothesis ([Maity, 2014](#)). However, upon closer inspection of the average basket value by device screen-size for tablet and mobile devices, a different picture emerged. If the media richness hypothesis holds, one might expect that decreasing screen size would result in lower average spend. On the contrary, this thesis found that brand of device was a much stronger predictor of average spend. This may relate in part to the resolution of the screen and quality of the interface on these devices – but may reflect a less tangible effect, such as the social desirability of a particular device correlating with propensity to spend online.

7.4.7 Are Morrisons' online grocery shoppers loyal?

Analysis of a sample of ~280k of Morrisons' online consumers indicated that Morrisons has established core of loyal customers. Around a fifth of Morrisons consumers have been consistently loyal over 2017 and 2018 – shopping in every quarter since they made their first transaction. Each quarter between Q2 2017 and Q4 2018, around half of Morrisons' active online users were 'returning customers'. According to Mixpanel (2019), an 8-week unbounded retention rate of 35% would be classed as 'elite'. Nearly a fifth of Morrisons' customers shopped in every quarter for 21 months to the end of 2018; and a further fifth shopped several times in that period, indicating that Morrisons' retention rate is relatively strong.

Despite this, the majority of customers have been 'disloyal' – as Morrisons' executives suspected. Of customers who made at least one transaction between Q1 2017 and Q2 2018, 59% did not transact in the six months to Q4 2018. Whilst this attrition rate

seems high, it is consistent with the findings of Nielsen (2015). They indicated that of those European respondents who had tried online grocery shopping, ~42% claimed to be regular online grocery shoppers and the remaining ~58% claimed not have done online grocery shopping recently. Harris et al (2017) reported greater loyalty to online grocery shopping with 64% of a sample who had ever shopped for groceries online claiming to have done so in the last month and a further 32% claiming to have done so in the past 3-12 months. This study did not however differentiate between the different online providers. Focus group respondents in this thesis spoke about ‘shopping around’ between more than one online provider. This was not universally asserted by respondents however, with one suggesting that they would remain loyal for as long as the service remained good; and that the effort of setting up a ‘favourites’ basket with a new provider disincentivised ‘shopping around’.

In summary, this thesis has shown that the majority of Morrisons’ online consumers are ‘disloyal’, but that this is consistent with findings at national and international level. Morrisons has been able to attract new customers consistently since online inception and around half of the audience are currently ‘returning’ customers. Focus group findings suggest that customers who are happy with their online provider are unlikely to switch due to the high initial time investment of establishing a ‘favourites’ basket. This does however limit Morrisons’ and other late entrants’ potential to acquire customers from those with higher online market shares, in what has been termed the ‘double jeopardy’ effect – whereby those with the largest market share enjoy the greatest loyalty.

Table 7.5: Triangulation summary of consumer practices following the digital transformation of grocery shopping

		Qual phase		Quan phase	
	Dimension	In literature	Interviews: retailer / industry perspective	Focus groups: consumer perspective	Transaction data
Demographics and characteristics	Gender and household	<ul style="list-style-type: none">• Companionate marriage and non-traditional households contributing to more males doing the grocery shopping• Ability to shop ‘anywhere’ could be contributing to a shift in gender roles• Proportion of females among online grocery shoppers ranges from around a third to around three quarters among different studies• Families with children are the most likely to shop for groceries online; the poorest and elderly are least likely	<ul style="list-style-type: none">• Shop is very disciplined online without pester power• Demographics of shoppers has changed with new geographic reach - fewer families	<ul style="list-style-type: none">• Shoppers disappointed to receive poor quality fresh produce - one remarked on it being a woman’s thing to select quality produce.• Women still primary shoppers, although men increasingly so.	<ul style="list-style-type: none">• The proportion of Morrisons’ consumers belonging to the more affluent ‘ABC1’ grouping was nearly 16 percentage points higher among online customers in 2016.• The proportion of female customers among Morrisons’ offline consumer-base was estimated to be just over half in 2016. By Q4 2017, 90% of Morrisons’ online consumer-base were reported to be female.
	Age	<ul style="list-style-type: none">• Generation X (those aged around 35-54) are the most likely to shop online• Conflicting findings relating to Millennials and younger users• Some evidence that the demographic of online shoppers has increased over time (that Millennials were the ‘early adopters’)	<ul style="list-style-type: none">• Since online inception have lost a few families and picked up single-professionals	<ul style="list-style-type: none">•	<ul style="list-style-type: none">• The proportion of Morrisons’ online consumers in the 25-39 age band was nearly 20 percentage points higher than among the ‘offline’ YouGov survey participants. Despite this, the 18-24 age group was the most underrepresented – just 2.7% of Morrisons’ online audience and around 8% of its offline audience were in this age bracket.

	<i>Location</i>	<ul style="list-style-type: none"> Distance from supermarket affects propensity to shop online Mobile technologies facilitate personalised, 'micro-geographies of consumption' Consumers enjoy shopping in relaxed home environment Consumers like that they can multi-task with home-based online shopping Consumers rarely have a set time or place to shop with online shopping 	<ul style="list-style-type: none"> Not being in-store allows consumers to show more self-restraint in avoiding confectionary. 	<ul style="list-style-type: none"> Easier to avoid temptation when shopping online Use 'favourites' to structure shop Use the basket as an on-going shopping list 	<ul style="list-style-type: none"> The location of consumers has changed since inception, in line with the increased coverage of Morrisons' online service. Despite this, the majority of customers remain in Morrisons' offline 'heartlands' of Yorkshire and the North East.
Practices and preferences	<i>Price-sensitivity</i>	<ul style="list-style-type: none"> Consumers spend more online: M-shoppers increase in value over time M-shoppers spend more than they used to in-store Individualistic spending - increased propensity to treat 	<ul style="list-style-type: none"> Customers are price sensitive and price savvy 	<ul style="list-style-type: none"> Customers look for good value and offers, but don't think the interface should look 'budget' For some users, speed and convenience is more important than engaging with offers. 	<ul style="list-style-type: none"> The vast majority (around 90%) of 'net product adds to basket' among Morrisons' customers emanated from 'price-insensitive' online behaviours. There is also little evidence that consumers are becoming more price-sensitive in-terms of their on-site behaviour. There is some evidence that Morrisons online consumers spend less than online consumers nationally.

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- Purchases not on shopping list – justified as taking advantage of offers
 - Consumers spend less online:
 - Online and household shopping more disciplined and thrifty
 - Shop less regularly, spend less online
 - There is some evidence that new or transient Morrisons consumers spend less per transaction than established long-term users.
 - There is some evidence that the average basket value is falling over time, although analysis of the long-term users suggests that existing users' basket values are not changing over time (except due to seasonal fluctuations).
 - Broadly speaking, the average basket size appears to 'hug' the minimum order value of £40 among established and transient Morrisons' customers.

Time-poverty

- Evidence to support increased time poverty:
- Twenty-first century families are 'time-poor'
- Consumers do whole shop in minutes, using 'favourites'
- Consumers who prefer to shop online are driven by convenience, with low requirement for variety, and lower demand for receiving products instantly
- Evidence contesting increased time poverty:
- Propensity to multi-task extends online shopping time
- Customers are time-poor
- Time saving is commonly reported - busy working, doing house related tasks, don't have time to visit supermarket.
- Consumers spent significantly more time per transaction in 2018 than 2017
- the average time-on-site per transaction for multi-day shoppers was higher than for one-day shoppers.
- the time-on-site per transaction for one-day shoppers in 2018 was lower than the time-on-site per transaction for one-day shoppers in 2017
- time-on-site per transaction per day for multi-day shoppers in 2018 was lower than the time-on-site per transaction per day for multi-day shoppers in 2017.
- In 2017, 11% of product adds to basket originated from time-poor behaviours; and an even smaller proportion, just 3% in 2018 ([Table 6.22](#)).

- Online shoppers spend a matter of seconds selecting products online, although this was similar to offline
- No evidence to support time being a factor of convenience online

Trust and basket composition

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none"> • Consumers are worried about purchasing perishable products online • Consumers are worried about receiving inappropriate substitutions when shopping online • More brands, but lower SKUs = higher spend • Brand loyalty (including own-brand) is higher online | <ul style="list-style-type: none"> • Consumers want choice and a broad range of products • Customers hate substitutions • Some customers fear missing out on deals if not in-store • Marketing fresh to customers online presents a challenge | <ul style="list-style-type: none"> • Most consumers expect full range of products online. • Consumers expect to be entertained / offered new options, products and recipe ideas online. • Consumers prefer to pick long dated perishable products and select their own fruit and meat. May indicate lower spend on these items online. • Some consumers prefer to shop for fresh offline and are disappointed to receive damaged or poor-quality fresh items. | <ul style="list-style-type: none"> - The average basket value has stabilised since Morrisons' online inception, but shows seasonal fluctuations with the least spent per transaction at Christmas. - Around half of all products added to basket emanate from 'stable' on-site behaviours such as engagement with previous orders and 'favourites' lists. - There has been a shift in on-site behaviour with respect to 'unstable' product adds to basket. Consumers were much more likely to populate their baskets from search results rather than by using the product catalogue or clicking on offers in 2018 than in 2017. • At the national level, the composition of online and offline grocery spending by food category is significantly different. • Nationally, consumers spend less on meat and 'sugars and confectionary' online than offline |
|---|---|---|---|

- Customers hate inappropriate substitutions.
- Driver attitude is important - especially since it is someone you are letting into your home.
- The Morrisons online sample was not significantly different from the LCF online sample signifying that the Morrisons sample has potential to be generalised to the national level.
- Re-weighting the Morrisons’ online sample to match the LCF online sample improved the alignment of the Morrisons’ online sample and online spending at the national level.
- Looking at expenditure on fresh ‘fruit and veg’ compared to processed and frozen ‘fruit and veg’ at the national level indicated that there was little difference between the online and offline samples.
- More than three quarters of spending on ‘fruit and veg’ was spent on fresh produce online and offline at the national level.
- Among the Morrisons’ online sample, the proportion of spending on fresh ‘fruit and veg’ was slightly higher than nationally.

<i>Devices</i>	<ul style="list-style-type: none">• desktop/laptop > in-store > mobile• m-shoppers tend to opt for known/branded goods because of screen size / low ‘media richness’• m-shoppers increase in value over time• m-shoppers spend more than they used to in-store	<ul style="list-style-type: none">• Online shop is very disciplined• Modern consumers use new technologies, e.g. contactless payment adeptly	<ul style="list-style-type: none">• Prefer to use search bar for navigation or will click on offers.• Likely to base most of order on favourites basket / previous order.• Tend to follow a routine - may thus be blind to changes on homepage.	<ul style="list-style-type: none">• In general average spend on desktop > tablet > mobile• Among tablet and mobile devices this was not a linear relationship, depending more on brand than screen size. This may relate in part to the resolution of the screen and quality of the interface on these devices, or may reflect a less tangible effect, such as the social desirability of a particular device correlating with propensity to spend online.
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- multi-channel shoppers (in some product categories) spend more than single channel shoppers
- search bar preferred method of site navigation
- Like offers to be shown as first options when navigating to a page.

*Adoption, loyalty
and accessibility*

- offline interaction with brand and online word-of-mouth recommendations most likely to attract consumers to online offering
- double jeopardy effect in force in online - those with lower market share suffer from lower brand loyalty
- Loyalty to a single retailer is lower online
- moving to online shopping requires significant shift in behaviour, so is a slow process
- shopping online does not usually entail
- Consumers are increasingly disloyal
- Consumers keep each other informed via social media
- Consumers like to talk to retailer through chat function
- Online can't replace experiential element / social interaction
- Consumers find initial effort of setting up online account cumbersome, so tend to remain loyal
- Relationship with drivers and service-line are important to the consumer - good service and feeling valued makes consumers loyal
- Of customers who made at least one transaction between Q1 2017 and Q2 2018, 59% did not transact in the six months to Q4 2018.
- Around a fifth of Morrisons consumers have been consistently loyal over 2017 and 2018 – shopping in every quarter since they made their first transaction.
- Each quarter between Q2 2017 and Q4 2018, around half of Morrisons' active online users were 'returning customers'.

discontinuation of shopping
offline

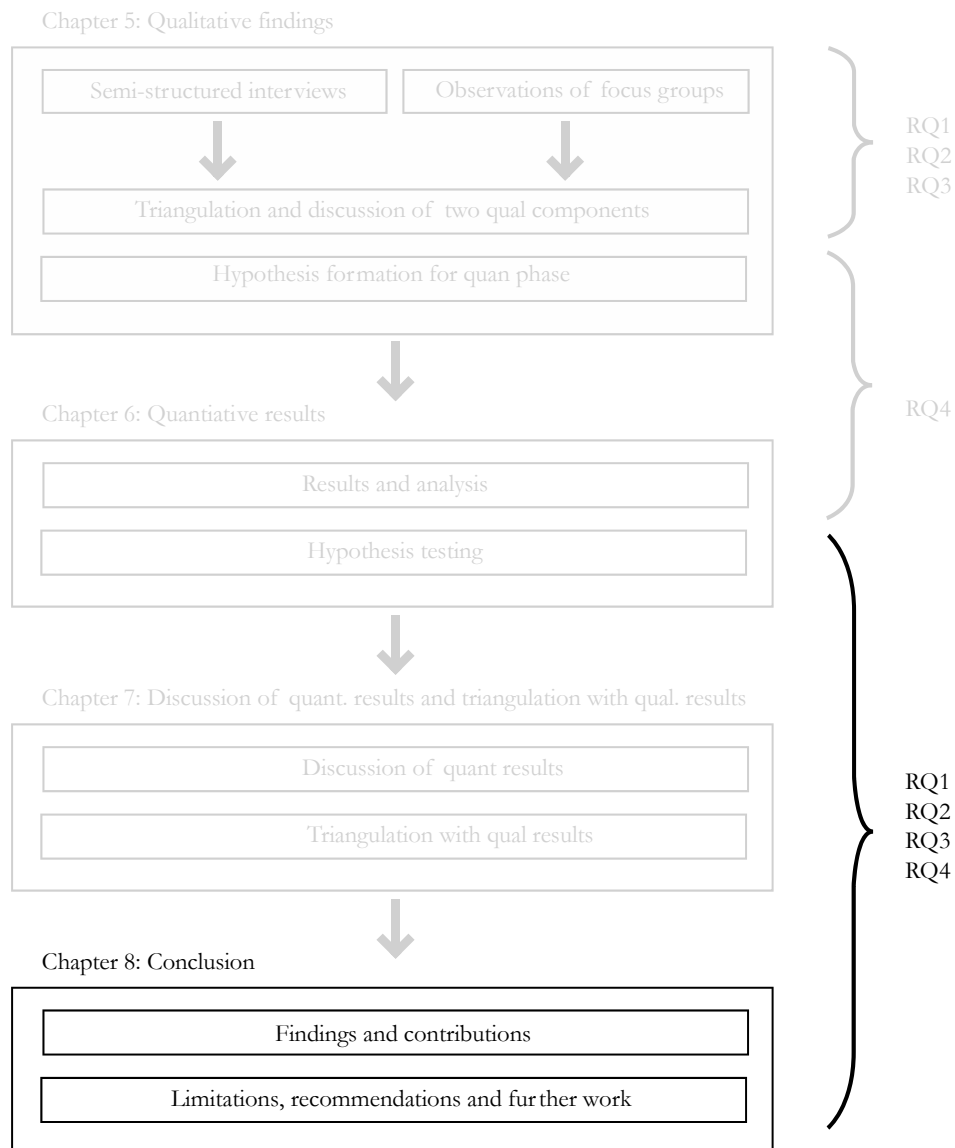
- Adoption does not imply continuance
- Online shopping perpetuates a ‘digital divide’, eroding the skills off offline shopping for some
- More brands, but lower SKUs = higher spend
- Brand loyalty (including own-brand) is higher online

*Consciousness,
behaviour and
practices of
consumption*

- Having to develop new skills to shop online shifts shopping into ‘discursive consciousness’ Shopping is (at least temporarily) no longer an automatic event.
- Whether conscious of it, consumers are always engaging in cognitive behaviours when shopping
- Consumers do not engage in cognitive behaviours most of the time, but respond to environmental cues and draw upon learnt skills
- Customers may be likely to edit a basket multiple times, in between other home-based practices.
- Customers use the shopping basket as a shopping list.

8. Conclusion

Figure 8.1: Final research design – conclusion, contributions, limitations and further work



This thesis set out to determine how traditional retailers and consumers are responding to the digital transformation of the UK's grocery shopping market.

Based on qualitative analysis of interviews with retail executives, directors, analysts and consumers; and quantitative analysis of hundreds of thousands of real online grocery transactions this thesis has unearthed a series of insights relating to digital transformation, and specifically to the digital transformation of the UK's grocery market:

- The drivers of digital transformation for the traditional retailer entering the UK's online grocery market are sparse and primarily defensive – with a focus on maintaining market presence and recapturing lost consumers. As a result, it is concluded that the existence of the online grocery market in the UK is largely consumer driven.
- The introduction of web technologies and their application to the UK's grocery market has seen a shift in the power balance between retailer and consumer. This shift is encapsulated in this thesis by the socio-technical concept of 'distribution of agency'. Using this concept allows practitioners to view socio-technical systems as 'social machines' and to evaluate the effect that changes in agency and power have on the success of digital transformations. In low-profit environments such as online grocery market, examination of the distribution of agency and how the retailer and consumer react could be core to survival in the market. It also has implications beyond management studies in terms of understanding consumer practices and the interaction of human and non-human agents.
- This thesis models digital transformation as a continuous and cyclical process which is bounded and driven by: financial aspects (constraints and opportunities); use of technologies (by retailers and consumers); and the

distribution of agency (between retailer, consumer and technology). A high-low scale is included in this model to measure the extent to which a retailer has the capability to benefit from these bounding factors, create new customer value and embed this within its core strategy. This model can be used by practitioners in management studies and beyond to predict and evaluate the speed and success of a company's (or industry's) digital transformation.

- Despite significant growth, the UK's online grocery shopping consumer base is primarily comprised of shoppers from higher socio-demographic backgrounds. The assumption (held by retailers and often reported in research to date) that consumers are time-poor and price-sensitive was shown not to be the case for the hundreds of thousands of transaction events examined. Furthermore, the propensity to shop for fresh produce in-store as opposed to online was not shown to be true among Morrisons shoppers or at the national level.

Chapter 1 of this thesis provided an introduction to digital transformation; to the UK's grocery market; and to the UK's fourth largest supermarket retailer, Morrisons, as it embarked on a late market entry to the UK's online grocery market. The two literature review chapters unearthed gaps in the study of digital transformation of grocery shopping from the perspectives of a retailer undergoing strategic change; and the consumer engaging in a new form of consumption. These changes were conceptualised in terms of the drivers for engaging in online grocery shopping, the strategic changes occurring to make the transition and the outcomes for retailers and consumers of the digital transformation of the UK's grocery market. A summary of the gaps identified and the approach and findings of this thesis are summarised in [Table 8.1](#) below.

This thesis adopted an interdisciplinary sequential exploratory mixed-methods approach. A web science approach drove the investigation-emphasising the socio-technical nature of online grocery shopping and considering the interplay of human and non-human agents. This thesis used a prominent single case study to explore the digital transformation of the UK's grocery market – namely the late market entry of the UK's

fourth largest supermarket retailer, WM Morrisons Plc (Morrisons), to the UK's online grocery market. This thesis makes several important contributions to the fields of web science, management, strategy and consumer behaviour and is unprecedented in its scope. Traditionally, studies of online grocery shopping have been small-scale and based on the reported experiences of shoppers. In contrast, this thesis used more than two years' worth of real consumer transactions – amounting to millions of transacted items. This was triangulated with focus group discussions with consumers and interviews with the majority of the executive board of Morrisons and several of its directors and long-standing employees; alongside a retail analyst and a competitor. Access of this scale is unprecedented for the UK's grocery market. The ability to interrogate real transaction data allows this thesis to transcend the questionable assumption that consumers' reported intentions are reflected in their actual consumption activities.

The sequential exploratory approach adopted by this thesis consisted of a qualitative exploratory phase – used primarily to unpick the digital transformation of Morrisons during their late entry to the UK's online grocery market; followed by a quantitative phase, used to understand more about changes in consumer characteristics and practices when shopping for groceries online. The qualitative phase of this thesis used semi-structured interviews with industry professionals and focus group observations with customers to address three research questions (RQs) relating to the digital transformation of retailers within the UK's grocery market:

RQ1: What are the drivers (and barriers) to entry in the UK's online grocery market?

RQ2: What strategic shifts occur when traditional supermarket retailers undergo digital transformation?

RQ3: What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

Insights drawn from the qualitative phase were then used to pose eight hypotheses relating to the digital transformation of consumer behaviour. These were used to address the fourth research question:

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

The findings and implications of this thesis with respect to the four research questions are summarised in Sections 8.1 and 8.2. Section 8.3 brings together the contributions made by this thesis, Section 8.4 discusses the limitations of this thesis and Section 8.5 plots a course for future research.

8.1 Digital transformation of traditional retailers – findings and contributions

The gaps identified in the digital transformation of the UK's grocery market literature are summarised in [Table 8.1](#). The table also shows how RQ1-RQ3 of this thesis have addressed each of the gaps and the findings that emerged to answer these questions. A short description of the key findings and contributions for each of RQ1-RQ3 follow after the table.

Table 8.1: Gaps in the digital transformation of the UK's grocery market literature and how they are addressed by this thesis

Gap(s) identified	This thesis...	
Digital transformation of the UK's grocery market as a whole	How RQ1-RQ3 address the gap(s)	Relevant findings / contributions

<p>Digital transformation in the UK's online grocery market is unstudied. Only found one grocery related digital transformation paper, none relating to online grocery shopping.</p>	<ul style="list-style-type: none"> • Considers UK online grocery market primarily through an in-depth case study. • looks more holistically at the UK's online grocery market and (using a web science approach) how socio-technical constraints affect the market and the individual retailers within the market. 	<p>This thesis used a web-science sequential exploratory approach. Analysis of semi-structured interviews with key retail personnel and focus groups with customers were used to answer RQ1-RQ3 and generate hypotheses for RQ4.</p>
Drivers of (and barriers to) digital transformation	How RQ1 addresses the gap(s)	
<p>Conflicts between authors / sectors have emerged particularly with regard to whether factors are incentives or disincentives for retailers undergoing digital transformation. The dominant positions are summarised in Tables 2.1 and 2.2.</p>	<p>Assesses the drivers of and barriers to entry for important UK case study Morrisons. As the fourth largest supermarket in the UK, Morrisons' late market entry facilitates insight into how the drivers and barriers to entry in the UK's grocery market interplay with their efforts to undergo digital transformation.</p>	<p>Barriers (for Morrisons/new entrants to UK online grocery market):</p> <ul style="list-style-type: none"> • Difficult to make online profitable • Market coverage already close to 100% in UK • Market cannibalisation occurring
		<p>Drivers (for Morrisons/new entrants to UK online grocery market):</p> <ul style="list-style-type: none"> • Defensive - to regain / protect consumer-base • To attract a new demographic • Acceptance of longevity of online market
Strategic change for retailers undergoing digital transformation	How RQ2 addresses the gap(s)	
<p>Dimensions of digital transformation have been suggested, e.g. (Matt, 2015), but the community calls for empirical evidence and limiting cases to be established.</p>	<ul style="list-style-type: none"> • Uses a socio-technical web science approach to propose a powerful diagnostic model for assessing technological change; building on Matt et al's 'four dimensions of digital transformation'. • This model is used to highlight the opportunities and challenges faced by 	<p>The model introduced is outlined is described in Chapter 7. The model and toolkit (see Table 8.2, Table 8.3 and Figure 8.2) can be used to evaluate and predict the progress of companies or industries undergoing digital transformation.</p>

retailers in the UK's online grocery market.

Limited understanding of the dynamics between human and non-human actants in digital transformation strategies.	<ul style="list-style-type: none"> • Uses a web science approach to introduce the concept to social machines to digital transformation theory. 	The web science, social machines concept of 'distribution of agency' added to the model of digital transformation allows for better understanding of web technologies, which are inherently socio-technical.
Outcomes of digital transformation	How RQ3 addresses the gap(s)	
<p>The role of human and non-human agents in shaping technology use has been proposed, but there remains little evidence of how this has manifested itself in digital transformation processes to date.</p> <ul style="list-style-type: none"> • difficulty isolating a strategic change from the wider activities business and from the market conditions; • lack of transparency in reporting; and • strategic goals may not be focussed on short-term financial gain, playing out over a number of years. 	<ul style="list-style-type: none"> • Uses qualitative methods and a web science approach to consider consumers and retailers as creative agents in the change process. • Leverages unprecedented access to real-world transaction data to model the outcomes of digital transformation of Morrisons – the fourth largest grocery retailer in the UK. Uses mixed-methods approaches to show how this relates to the UK market as a whole. • Uses several years of transaction and financial data; alongside qualitative findings from interviews to triangulate the outcomes of digital transformation; and to isolate 'intentions' from 'outcomes'. 	<p>Morrisons: Late-mover advantage is limited in grocery, although leveraging the expertise of Ocado has enabled late-mover Morrisons to develop a sustained and growing presence, in contrast to their failed convenience sector market entry. Morrisons has shown that traditional retailers can be strategic in facing this new challenge, having hedged their exposure to Amazon by becoming a supplier to Amazon's nascent online grocery presence in the UK</p> <p>Market: The application of the digital transformation model to the industry as a whole highlights that it is has low financial opportunity. Entry for traditional retailers is made more challenging by the entrance of non-traditional competitors such as Amazon, who have more established technical skills and have addressed the 're-distribution of agency' issue facing traditional grocers. There are opportunities to increase technological skill and embed this strategically, or to hedge the risk from new entrants, as in the case of Morrisons' agreement with Amazon.</p>

RQ1: What are the drivers (and barriers) to entry in the UK's online grocery market?

This thesis considered the plight of traditional retailers joining the UK's online grocery market by modelling the change process as a 'digital transformation'. With respect to the drivers and barriers to entry in the UK's online grocery market, this thesis has shown that the UK's online grocery market is saturated; and that the high logistical costs involved in delivering perishable products alongside the low margins make the market

inhospitable for retailers. Despite this, most of the big retailers have been 'forced' online in order to recapture lost customers. This shifting power dynamic from retailer to consumer in the online era is discussed in more detail with respect to RQ2 below.

In the specific case of Morrisons as a late-entrant with low technical expertise, it was shown that their entry to market was defensive - driven primarily by necessity and consumer-demand.

RQ2: What strategic shifts occur when traditional supermarket retailers undergo digital transformation?

With respect to the strategic changes and outcomes of digital transformation, this thesis made significant enhancements to Matt et al's 'four dimensions of digital transformation'. These are outlined in more detail in Section 7.2 and in Section 8.3 below, but briefly comprise:

- First, a **'high-low' scale** was used to rate a firm/sector's **capacity** of to **enact change** in relation to each dimension.

This highlighted the opportunities and challenges faced by the UK's online grocery market as a whole and showed how factors such as market entry order and technological expertise interplay with the dimensions of digital transformation. It was shown how this model can be used in practice to differentiate the strengths and weaknesses of the digital transformation of three UK grocery retailers.

- Second, the addition of a fifth dimension – **distribution of agency** – enabled this thesis to think of online grocery market as a 'social machine' in which the distribution of power between retailer, technology and consumer is mutable and negotiated.

This dimension was used to show how power has shifted away from the traditional retailer in the online grocery market and to evaluate Morrisons' capacity to adapt to this new relationship. Morrisons' partnership with Ocado shows a capacity to 'buy in' expertise, but it is not yet clear whether they will be able to cultivate expertise in-house to make online a profitable endeavour. In other contexts, this fifth dimension will allow researchers to evaluate power shifts in other web and technology-enabled transformations but also forms an olive branch between management studies and the growing web science literature relating to social machines.

- Third, reconceptualising digital transformation as a continuous cycle – where 'changes in value creation' and 'structural changes' are bounded by the other three dimensions 'financial aspects', 'use of technologies' and 'distribution of agency'. Each can either drive or constrain a company's ability to undergo successful digital transformation. The 'health' of the digital transformation can be thought of in terms of the continued motion of the digital transformation cycle.

Together, these amendments to the dimensions of digital transformation create a powerful diagnostic model for assessing the success of technological change; for comparing firms within a market and for making comparisons between markets and sectors. [Table 8.2](#), [Table 8.3](#) and [Figure 8.2](#) form a toolkit for future researchers to analyse digital transformation in and beyond the UK's grocery market. They form the basis of a study of digital transformation that allows practitioners to compare companies and markets, predict and evaluate how successful their digital transformations are and identify any features specific to a given company or industry.

As well as equipping practitioners with a toolkit, this thesis applied the model to the case of the UK's online grocery market. This was used to evaluate the digital

transformation of the UK's fourth largest supermarket retailer's entry to the online grocery market, but also to consider the market as a whole (see [Table 8.2](#)).

Table 8.2: Examples of high, medium and low capacity to enact change dimensions

	High	Low
<i>Financial aspects</i>	<p>Have shown sustained profits/increased revenue since adopting the technology.</p> <p>There is sufficient margin or inefficiency in the market for all firms to benefit; or to outperform competitors.</p>	<p>Sustained losses since adopting the technology.</p> <p>No evidence of profitability using the technology in other industries/among other firms.</p>
<i>Use of technologies</i>	<p>History of engagement with technologies.</p> <p>Management committed to technology.</p> <p>Dedicated technology team and skilled employees. May well be a frequent 'first adopter' in the market.</p>	<p>No history of engaging successfully with technological innovations.</p> <p>Little or no evidence of management's commitment to technology.</p> <p>Little or no evidence of a technology dedicated team. May have actively rejected technological innovation in the past.</p>
<i>Distribution of agency</i>	<p>Power is transferred in favour of the retailer/firm due to the capacity or use of technology. This may be in the form of intelligence, increased demand, cost-saving, or other efficiencies.</p>	<p>Power is transferred in favour of the technology and/or consumer due to the capacity or use of technology.</p>
<i>Changes in value creation</i>	<p>Entering the market presents new value for consumers, this may be due to the capabilities of the technology itself, or due to innovation on the part of the firm.</p>	<p>Entering a market has little or no new value for consumers and the firm mimics existing retailers, offering nothing new.</p>
<i>Structural changes</i>	<p>Makes systemic changes to accommodate and make the most of the opportunities presented by a new technology.</p>	<p>Makes little or no effort to restructure company to accommodate or make the most of a new technology. May abandon technology in favour of changing management or operational structures.</p>

Figure 8.2: The cycle of digital transformation – reworking of Matt et al’s framework

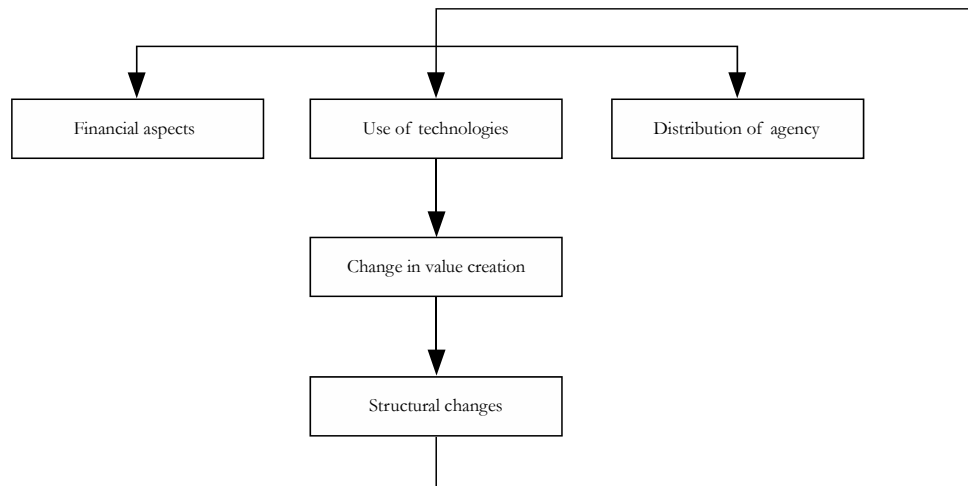


Table 8.3: Augmentation of Matt et al’s four dimensions of digital transformation applied to the UK’s online grocery market

Dimension	Capacity to enact dimension		Explanation
	Morrisons-specific	Market-specific	
<i>Financial aspects</i>	Low	Low	The industry as a whole has shown little evidence of the profitability of online grocery shopping. Morrisons’ executives and employees were clear that the move online was not profit seeking but defensive - in order to slow the exodus of customers to competitors.
<i>Use of technologies</i>	Medium	High	<p>Use of technology includes the resources and capabilities to exploit technologies. Morrisons have embarked upon a cultural overhaul, including a condensing the executive board. The deal with Ocado is unprecedented in the industry, but also risk averse in terms of outsourcing to experts rather than developing in house.</p> <p>Despite the cultural overhaul, Morrisons remain inexperienced in online marketing and consumer analytics. Their leveraging of Ocado’s expertise has facilitated their entry to market, but to benefit long-term, they will need to expand their skills to alter the distribution of agency in the market; and to create new value.</p>

<i>Distribution of agency</i>	Low	Medium	Online grocery market is consumer demand driven. Consumers are able to leverage online technologies to readily compare products between retailers and now do less work – no longer travelling to the supermarket, processing products or transporting them. Morrisons' skillset as a traditional retailer constrained by interfacing with web-technologies and unfamiliarity with channel. They claim to be no longer 'technophobic' but have limited capacity and skills to make the most of the new communication and data-analytical opportunities. The deal with Ocado is an example of 'buying in' this expertise with respect to the logistics of home delivery.
<i>Changes in value creation</i>	Medium	Medium – high among specialist retailers	Morrisons' executives, competitors and analysts alike were unable to pinpoint clear innovation in Morrisons' entry to market, except to offer Ocado's market-leading customer service at Morrisons' lower price point. More broadly, Morrisons online customers stand to benefit from the generally cited benefits of online including convenience and time-saving. The executive team did highlight the importance of maintaining skilled people (e.g. butchers) and managing their own supply chain and manufacturing - claiming this gave them a point of difference. It was acknowledged by a competitor that this was where Morrisons' core value-creation potential resided.
<i>Structural changes</i>	Medium	High	Leveraging Ocado's established and market leading hub and spoke model bodes well for Morrisons' offering. The integration of its supply chain and digitisation of stock ordering support this transition. However, the online offering has been siloed from offline offering. Morrisons have begun to use stores as 'spokes' to increase reach but there is no omnichannel offering at present.

RQ3: What are the outcomes of traditional retailers undergoing digital transformation in the UK's grocery market?

Initial indicators suggest that Morrisons' financial performance since online inception has been strong. Despite this, operating profits and firm value remain lower than in 2013, prior to the loss-making years of 2014 and 2015. This is seen across the industry where intense price competition has seen firms 'race to the bottom' to compete with discounters.

As a late-entrant, it was shown that Morrisons' biggest risks remain in the overhead costs of servicing online customers and the risk of 'cannibalising' their consumer base. The cost of partnering with Ocado may also be prohibitive to turning a profit, although

the risk of sunk and wasted R&D costs has been reduced by leveraging Ocado's market-leading technology.

In terms of the 'distribution of agency' dimension introduced in this thesis, it has been shown that Morrisons will need to recapture some of the agency lost to the consumer and technologies in the online grocery market. Morrisons' historical identity as a risk-averse, low-tech firm makes engaging with the opportunities of online technologies more challenging. Their relationship with Ocado has allowed them to 'buy in' the logistical element of this, but the likes of Tesco and Amazon remain well ahead in terms of personalising the online experience and tracking consumer behaviour.

The UK's online grocery market is a saturated and low-profit market for traditional retailers. The entry of non-traditional competitors such as Amazon raises the stakes further. Amazon has the potential to disrupt the online market in a similar fashion to Aldi and Lidl's' disruption of the offline market. Despite this, Morrisons has shown that traditional retailers can be strategic in facing this new challenge, having hedged their exposure to Amazon by becoming a supplier to Amazon's nascent online grocery presence in the UK. With little evidence of profitability, online grocery is market in which retailers do not thrive, but might just survive.

The outcomes of the digital transformation of the UK's grocery market in terms of consumer demographics and consumer practices are discussed in more detail in Section 8.2 below.

8.2 Digital transformation of consumer practices – summary of findings and key contributions

RQ4: Has the digital transformation of grocery shopping reconfigured consumer strategies?

As well as considering the digital transformation of traditional retailers in the UK's grocery market, this thesis considered online grocery shoppers and how their characteristics and practices differ to those engaging in offline consumption (RQ4). Literature to date has largely relied on small-scale, self-selecting survey respondents; or small synthetic laboratory experiments to determine online behaviours. This thesis began with a qualitative phase which highlighted the perceptions of online consumer behaviour from the perspective of retail executives, analysts and consumers. Where this thesis departed from the extant literature was in joining these perceptions and intentions up to the real transaction data of hundreds of thousands of Morrisons.com grocery shoppers. This allowed hypotheses emanating from the qualitative phase to be tested in the quantitative phase. This effectively transcended the intention-behaviour link relied upon by many previous authors and contributes concrete findings to the understanding of online grocery shopping practices in the UK.

Analysis of the transaction data revealed that from outset Morrisons' online audience was more affluent and had a higher proportion of female customers than estimates of its offline population. These gaps widened over the next two years such that by the end of 2018, around 90% of Morrisons' customers were female and 84% belonged to more affluent National Readership Survey groups.

The disparity between Morrisons' online and offline consumer-base in terms of geo-location was initially a function of the limited reach of their online service. As the reach

of the online offering expanded there has been an increase in the proportion of customers in the South East and London. This has not been substantial however, indicating that Morrisons' may be struggling to gain market share away from their heartlands. Consumers showed little evidence of being price-sensitive or time-poor and the proportion of female among its consumer-base was shown to have increased. It was also shown that among Morrisons' customers and at the national level online baskets contain lower proportions of 'meat' and 'sugars and confectionary' than offline baskets and that online consumers spend no less on fresh 'fruit and veg' than offline customers. Exploring concurrent practices using Shove and Meier et al's 'dimensions of practice' suggested that customers may feel that they are saving time because they value time in the home and the ability to multi-task above absolute time-saving on grocery shopping. Morrisons' customers were no less loyal than online grocery shoppers generally and this was consistent with the reports of consumers who suggested that they would remain loyal for as long as the service remained good; and that the effort of setting up a 'favourites' basket with a new provider disincentivised 'shopping around'.

In summary, Morrisons' online consumers do not appear to be engaging in highly price-sensitive online behaviours and average basket values are not dissimilar from those at the national level. Customers are much more likely to be swayed by the speed and convenience of online more than how cheap it is. There was however evidence of a lower tendency to buy 'treat' products in the sugars and confectionary food category – consistent with claims that the online shop is more disciplined.

Similarly, Morrisons' users showed evidence of becoming less time-efficient and spending more days (and more time) on their transactions over time, contrary to claims that the primary reason for shopping on-line was to save time. Exploring concurrent practices using Shove and Meier et al's 'dimensions of practice' suggested that customers may feel that they are saving time because they value time in the home and the ability to multi-task above absolute time-saving on grocery shopping.

This thesis used national-level statistics to show that the composition of online and offline grocery baskets is distinct and that customers spend less on meat and sugars and confectionary online. It was also shown that Morrisons' online customers are not significantly different from online consumers nationally in this respect and that realigning the samples geographically improved this match further. It was therefore suggested that findings among Morrisons' customers provides potential to be generalised to UK online grocery shoppers more generally.

It was shown that the Morrisons' online sample could be geographically reweighted such that it aligned well with the ONS' national Living Costs and Food survey. This indicated that findings among Morrisons' customers have potential to be generalised to UK online grocery shoppers more generally.

Table 8.4: Gaps in the consumption in online grocery shopping literature and how they are addressed by this thesis

Gap(s) identified	This thesis...	
Digital transformation of consumer practices	How RQ4 addresses the gap(s) in the literature	Relevant results from RQ4
Not aware of any large-scale studies of UK online grocery shopping	Makes use of a huge volume of real-life transaction data alongside interviews with key retail executives, analysts and customers.	
Conflicts between authors / sectors have emerged particularly with regard to how demographics relate to consumption practices online. Conflicts identified included: <ul style="list-style-type: none"> Gender – inconsistency in findings relating to whether men are more likely to shop online. Age – some studies find young people spend more online, others find them a minor contributor; similar conflict between spending habits of older people and 	Utilises access to a huge volume of real-life transaction data along with national level statistics to assess the demographic characteristics of the UK's online grocery shoppers. Also uses focus-group responses to triangulate findings in terms of consumer perceptions and actual consumer behaviour.	<ul style="list-style-type: none"> See Table 7.5 for fuller description of all results relating to demographics and online practices. See Table 6.38 for the results of statistical tests performed. <p>In brief:</p> <ul style="list-style-type: none"> The proportion of Morrisons' online consumer base belonging to the more affluent 'ABC1' grouping; and the

<p>propensity to engage with technology.</p> <ul style="list-style-type: none"> • Role of geography – both the erosion of distance and the convenience/inconvenience of online shopping not well established. 	<p>proportion of women are increasing.</p> <ul style="list-style-type: none"> • The vast majority of ‘net product adds to basket’ among Morrisons’ customers emanated from ‘price-insensitive’ online behaviours. • Loyal users are not becoming more price-sensitive over time. • Consumers spent significantly more time per transaction in 2018 than 2017 • the average time-on-site per transaction for multi-day shoppers was higher than for one-day shoppers. • the time-on-site per transaction for one-day shoppers in 2018 was lower than the time-on-site per transaction for one-day shoppers in 2017 • time-on-site per transaction per day for multi-day shoppers in 2018 was lower than the time-on-site per transaction per day for multi-day shoppers in 2017. • In 2017, 11% of product adds to basket originated from time-poor behaviours; and an even smaller proportion, just 3% in 2018 (Table 6.22). - Around half of all products added to basket emanate from ‘stable’ on-site behaviours such as engagement with previous orders and ‘favourites’ lists. - There has been a shift in on-site behaviour with respect to ‘unstable’ product adds to basket. Consumers were much more likely to populate their baskets from search results rather than by using the product catalogue or clicking on offers in 2018 than in 2017. • At the national level, the composition of online and offline grocery spending
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	by food category is significantly different.
	<ul style="list-style-type: none"> • Nationally, consumers spend less on meat and 'sugars and confectionary' online than offline. • The Morrisons online sample was not significantly different from the LCF online sample signifying that the Morrisons sample has potential to be generalised to the national level. • More than three quarters of spending on 'fruit and veg' was spent on fresh produce online and offline at the national level. • Among the Morrisons' online sample, the proportion of spending on fresh 'fruit and veg' was slightly higher than nationally. • In general average spend on desktop > tablet > mobile • Among tablet and mobile devices this was not a linear relationship, depending more on brand than screen size. This may relate in part to the resolution of the screen and quality of the interface on these devices, or may reflect a less tangible effect, such as the social desirability of a particular device correlating with propensity to spend online.

Consumer preferences and new online behaviours have been proposed, but there is little empirical evidence to date.

Looks to avoid weaknesses in the TAM and TPB approaches such as the simplification of human agency and the assumption that experimental studies infer real-life behaviours. This is achieved by using real-world data and by engaging holistically with consumer practices from

the perspective of the individual. Particular areas of investigation include addressing the conflicts in findings with respect to channel preference; time-poverty; price-sensitivity and whether shoppers avoid perishable good when shopping online.

The key contributions of this thesis, as discussed in Chapter 7 and in Sections 8.1-8.3 are summarised in [Table 8.5](#) below.

Table 8.5: Summary of key theoretical, methodological and empirical contributions of this thesis

Type of contribution	Summary of contribution
<i>Theoretical</i>	<p>This thesis presents a powerful model of digital transformation, building on Matt et al's four dimensions of digital transformation. These amendments model digital transformation as a continuous and cyclical process and comprise a toolkit for evaluating, predicting and understanding the process and outcomes of digital transformation. This enables comparison of individual firms within their market; and comparison of markets with other markets/sectors.</p> <p>The toolkit comprises:</p> <ul style="list-style-type: none"> • Cyclical model of digital transformation (see Figure 8.2) • The first is a 'high-low' scale to define the capability of firms to enact digital change in each dimension. (see Table 8.2 for application of scale to UK's grocery market; see Table 8.3 for more general description of how to apply the scale to other companies and industries) • The second addition furthers understanding of digital transformation by encapsulating the sociality of the web as a retail medium. This was introduced via the concept of 'social machines' and considering how agency is distributed between retailer, technology and consumer in the online grocery shopping context.
<i>Methodological</i>	<p>This thesis has contributed methodologically by contributing tools for future web scientists and those engaged in management, strategy, applied social theory and retail more generally.</p> <p>As well as the enhanced model of digital transformation, this thesis showed how to use a sequential exploratory approach to ascertain the opinions and assumptions of retailers and consumers and then to generate and test hypotheses emerging with empirical datasets.</p> <p>This thesis also included an application of ideas of theory of practice to online grocery shopping. This showed how thinking of consumer behaviour in terms of concurrent practices provides potential for understanding seemingly contradictory and 'irrational' behaviours not well modelled by the 'intention-behaviour' link.</p> <p>This thesis also showed a method of aligning sample data to population level observations for the UK's grocery market. This generates the potential to generalise findings to the national level and beyond.</p>

Empirical

A model of digital transformation was developed (see methodological contributions below). The afore mentioned model allowed this thesis to characterise the UK's online grocery market and Morrisons' role as the fourth largest retailer and late market entrant (see theoretical contribution above and [Table 8.2](#)) The application of the digital transformation model proposed in this thesis to the UK's online grocery industry as a whole highlights that it has low financial opportunity and that late-mover advantage is limited. Entry for traditional retailers is made more challenging by the entrance of non-traditional competitors such as Amazon, who have more established technical skills and stronger relationships with consumers. Despite low financial opportunities and high logistical overheads, the addition of the 'distribution of agency' dimension shows that there are opportunities to increase technological skill and embed this strategically, or to hedge the risk from new entrants, as in the case of Morrisons' agreement with Amazon.

The analysis of hundreds of thousands of real online grocery transactions is unprecedented in the field, representing up to 10% of all UK consumers. Paired with the adjustments suggested to align the dataset to the UK as a whole, this offers meaningful insights for online grocery shopping at the national level.

This thesis also provided evidence of online consumer behaviour not consistent with the assumptions of retailers and much previous literature. It showed that online grocery shoppers were not averse to purchasing perishable goods online; and were becoming less price-sensitive and time-sensitive over time.

Specifically, there was sufficient evidence to reject the null hypotheses and accept the following alternative hypotheses:

Some evidence to reject H_{04.1} and accept alternative hypothesis:

HA_{4.1} 'Time-on-site per transaction' in 2017 was statistically less than 'time on site per transaction' in 2018.

The confidence interval around the difference in medians between 2017 and 2018 suggest that the increase in time on site per transaction was only a few minutes.

Evidence to reject H_{04.2} and accept alternative hypothesis:

HA_{4.2} 'Time-on-site per transaction' for one-day shoppers was statistically less than 'time on site per transaction' for multi-day shoppers.

The difference in medians between the one-day and multi-day shoppers amounted to over an hour, supporting the finding that shoppers who transact multiple times over a number of days spend more time on their shop than those who transact once.

Some evidence to reject H_{04.4} and accept alternative hypothesis:

HA_{4.3} 'Time on site per transaction per day' for one-day shoppers was statistically more than 'time on site per transaction per day' for multi-day shoppers.

Despite there being a statistically significant difference between the median times, the difference was small at around two minutes - the results suggest that multi-day shoppers spend almost as much time per day of their multi-day transaction as one-day shoppers do in total.

Evidence to reject H_{04.4} and accept the alternative hypothesis:

HA_{4.4} 'Time on site per transaction' for one-day shoppers in 2018 was less than 'time on site per transaction' for one-day shoppers in 2017.

There is moderate evidence that the time on-site per day for one-day transactions decreased between 2017 and 2018 with the median time on site decreasing by around seven minutes.

Evidence to reject H_{04.5} and accept the alternative hypothesis:

HA_{4.5} 'Time on site per transaction per day' for multi-day shoppers in 2018 was statistically lower than 'time on site per transaction' for multi-day shoppers in 2017.

The time per transaction per day for multi-day shoppers decreased by around ten minutes between 2017 and 2018.

Evidence to reject $H_{06.3}$ and accept the alternative hypothesis:

HA6.3 The proportion of revenue attributed to each food category was the same among the Morrisons online sample as among the LCF online sample in 2016.

Evidence to reject $H_{07.1}$ and accept the alternative hypothesis:

HA7.1 The average basket value is different on desktop, tablet and mobile devices (Desktop > Tablet > Mobile in general).

8.4 Limitations

This research faced several challenges. One of the key limitations of this study was the lack of offline Morrisons data to conclude whether there have been systematic shifts in consumer behaviour in the online grocery shopping era. To address this, this thesis aligned the geolocation of the Morrisons' sample to the results of the Living Costs and Food (LCF) survey. This alignment was successful in terms of matching the basket composition of the LCF, but it is not clear whether other demographic features and practices are well matched. Furthermore, whilst the size of the sample used in this study was vastly bigger than that used by the ONS to estimate national level behaviour, it was still only a small proportion of the wealth of data collected by Morrisons and other retailers. In the early phases of this thesis, the quality of the Google Analytics tracking was poor which delayed the quantitative phase of this thesis and resulted in a relatively short time-period of good quality data. The assignment of product categories and freshness to assess basket composition was not trivial, due to the inconsistent way CIOPOP and LCF surveys report on food categories. Some categories (e.g. fruit and vegetables) were well defined in terms of freshness, whilst others (such as meat and fish) were not divided into fresh and frozen/processed products. Furthermore, complex products containing multiple food groups were difficult to classify and no clear advice for doing so exists in the LCF e-commerce.

The focus group responses used in this thesis were observational only – there was no input into the questions that respondents were asked. This limited the depth to which concurrent practices could be explored in detail. Finally, the interview sample was small.

In the case of Morrisons' executives and senior staff this reflected the very small executive board under David Potts' tenure. It would however have been desirable to gain more insight from competitors and retail analysts about the drivers, strategic shifts and outcomes of Morrisons' digital transformation.

8.5 Implications of this thesis and recommendations for further work

This thesis has responded to Matt et al's call for examples of their four dimensions of digital transformation, but has expanded the armoury of management and strategic studies practitioners by proposing three enhancements to Matt et al's four dimensions. These amendments transform the model from a set of descriptive characteristics of companies undergoing change, to a powerful model of digital transformation. This model includes a toolkit for evaluating, predicting and understanding the process and outcomes of digital transformation. It also introduces the social machines concept of 'distribution of agency' pertinent to the web which is inherently socio-technical in nature. The distribution of agency allows the practitioner to consider how the power balance between retailer, consumer and technology affects the digital transformation process. This model enables comparison of individual companies within their market; but also, comparison of markets with other markets/sectors. It falls upon the community to use this model, test it and refine it. There is particular scope to apply the theory of consumption to this model to expand the role and understanding of the consumer.

With respect to the Morrisons case study - the identification of a rich dataset which has potential to represent online grocery shopping behaviour at the national level presents exciting opportunities to expand understanding in a sparsely researched field. There is a plethora of further analysis that can be done with the Morrisons.com transaction data

used in this thesis. For example - clusters of behaviour and practices could be extracted and used to further the understanding of online grocery shoppers; and predictive models/co-variant analysis could be performed to estimate the value and contents of future baskets. Other areas of interest include periodicity in sales revenue; variation in behaviours by location and device use; and how the capacity to edit baskets affects basket composition. The discovery that a high proportion of product adds to basket emanate from unstable sources also motivates qualitative investigation. This would involve working with shoppers to ascertain how they engage with online shopping and the reasons they give for their behaviours. Employing insights from qualitative and quantitative studies will allow theoretical and predictive models of consumption behaviour to be developed. This thesis has only scratched the surface of what is possible in the realm of considering quantitative data in terms of the confluence of practices. There was shown to be apparent contradictions in focus-group consumers consistently claiming that online grocery shopping and the ability to edit baskets saved them time, whilst analysis of the transaction data appeared to show the contrary. This suggests that the way consumers value their time differs in these scenarios. This could be explored further in qualitative and mixed-method studies to give a more meaningful interpretation of seemingly 'irrational' behaviours.

Morrisons have been pioneering in allowing access to their data for this thesis and their commitment to improving our understanding of online consumers is testament to this. There is scope for other companies and researchers work together to corroborate or contest the findings among Morrisons' customers for other retailers and customers in the UK and beyond.

The digital transformation of the UK's grocery market, its retailers and its consumers will never be complete. This thesis has contributed to a theoretical model; outlined methodological tools and provided empirical evidence to support the analysis of digital transformation going forwards. Despite the financial challenges facing all retailers in the online grocery market, it was shown that Morrisons' entry to market has been financially

successful to date, but defensive and consumer driven in nature. Many assumptions about online consumer behaviour-such as price-sensitivity and time-poverty-have been debunked.

Appendices

Appendix A: A history of grocery shopping in modern Britain

Grocery shopping in Britain underwent a period of significant change over the course of the twentieth century. The period was punctuated by two world wars, financial boom and bust, huge technological advancements and socio-political change that would reshape the family, workplace and the consumption of goods. The twentieth century retailer's strive for greater efficiency and profitability saw the emergence of mass-production, self-service and the birth of the supermarket as we know it today. No longer were customers served at the counter, but instead they were armed with a basket or trolley and expected to select items for themselves and pay on the way out.

The changing role of women in the home and workplace has been perhaps the most significant factor in the reconstitution of the family as a unit of grocery consumption ([Glennie et al, 1996](#)). Women made up 29% of the UK workforce in 1900. This figure rose to 46% by the beginning of the twenty-first century (Lindsay, 2003). This has led to increased time constraints on women's traditional provisioning roles (in what sociologists have referred to as 'time poverty' ([Wajcman, 2015](#))) and delayed childbearing. Fertility among mothers aged 35 and over surpassed the rate for those under 25 for the first time in 2014 ([McLaren, 2015](#)). Other significant changes have been the increase in young adults living away from the parental home, an increase in divorce/separation, and an aging population. These factors have all contributed to an increase in single-person households such that the homogeneity of the nuclear or extended family unit as the primary consumer has been disrupted ([Joseph Rowntree Foundation, 2006](#); [ONS, 2010](#)).

The twenty-first century has seen web technologies prompt a further revolution in retailing which has begun to have a serious impact on the way households source everyday provisions. Consumers increasingly opt to order their grocery shopping online, 11% cited online grocery shopping as their primary channel in 2015, compared to 6% in 2011 ([IGD, 2016](#)), where previously they would have frequented supermarkets or grocery stores in person. This shift fundamentally reshapes the interaction of consumer and retailer and the potentially implies significant changes in consumption practices ([Kim, 2007](#); [Ramus, 2005](#); [Constantinides, 2004](#); [Onwuegbuzie and Leech, 2005](#)).

This history of grocery shopping explores the emergence of the supermarket and how political, social, commercial and technological factors have shaped grocery consumption in twentieth and twenty-first century Britain. It further discusses how the emergence of online grocery shopping presents a significant opportunity to re-examine grocery consumption behaviour.

Early twentieth century (1900-1950)

Grocery consumption during the first half of the twentieth century was highly regulated in Britain, owing to rationing and Retail Price Maintenance (RPM) - whereby retailers were forced to sell products at a given (fixed) price. RPM was imposed in response to the crippling economic and trade implications of the First and Second World Wars ([Mercer, 2010](#)).

Meanwhile, the US was largely unencumbered by retail restrictions, but was experiencing its own social and economic pressures following the First World War. By the 1920s, the citizens of the US were ready for a fundamental shift in the way groceries were presented and consumed ([Cohen, 2004](#)). It is to the US we thus turn to understand the emergence of the supermarket.

Retailers were experimenting with a new grocery store format in the 1910s - the self-service open-shelf store ([Blanke, 2002](#)). Prior to the introduction of self-service, customers were served at a counter and the proprietor was responsible for retrieving and weighing out products. Prices were rarely displayed such that negotiation was a key component of the retailer-consumer exchange. Prior to the introduction of self-service, shoppers were active consumers, expected to haggle with, threaten, praise, cajole, or shame the grocer, as circumstances warranted ([Deutsch, 2010](#), p. 2). The introduction of self-service - whereby products were presented in open-shelves and with fixed prices led to a fundamental collapse of this dyadic communication.

The allure of self-service for the retailer was clear - customers could be processed in greater volumes, at greater speed and with fewer staff than ever before ([Hamlett et al, 2008](#)). What then was the motivation for the consumer? By accepting the self-service model, consumers apparently relinquished their agency in negotiating price; forwent individual customer service; and took on more work negotiating with an array of pre-weighed goods. Time efficiency and choice (and thus potential savings) emerge as the most plausible motivators ([Shaw, 2004](#)), but an examination of the socio-economic climate of early twentieth century America offers insight into why choice and price have emerged as dominant drivers of grocery consumption.

The US experienced a period of hyperinflation following its involvement in World War I. As prices continued to rise, so did mistrust in grocers perceived to be artificially inflating prices ([Deutsch, 2010](#)). Amid continued discontent, the blame for exorbitant prices was also directed at women. As the primary shoppers they were responsible for negotiating the price of goods. It was therefore asserted that women must be failing in their role to keep prices down.

Self-service pioneers seized upon this opportunity to advertise to women, purporting to offer the (female) consumer autonomy and independence. This was seen as preferable, even if it meant relinquishing the bargaining power and personal attention previously

afforded. Agency exhibited in choosing between products, or indeed stores, allowed women to reassert their control over the shopping and prove prudence in their decision making,

[a]s purchasing agents, women could command respect for exhibiting qualities previously honoured primarily in men – capacities for planning, efficiency, and expert decision-making. ([Marchland, 1985](#), p. 168)

Piggly Wiggly, the brain child of Clarence Saunders, claims to have opened the first self-service store in 1916, although several grocers were experimenting with the idea across the US. Albert and Hugh Gerrard reputedly beat them to it in 1914, with their Triangle Groceteria store in Pasadena. To aid the navigation of such stores, the Gerrards begun arranging groceries alphabetically in 1915. Layout has since become the domain of retail psychologists, who assess consumer behaviour and position products to maximise customer spend ([Derbyshire, 2004](#)).

Open shelving allowed consumers to compare and contrast products which were presented in uniform weights and were assigned fixed, advertised prices ([Dowling, 1993](#); [Stobart, 2012](#)). Competition between brands, who now had to fight for the attention of consumers led to a rapid rise in the importance of advertising, brand loyalty and product differentiation that still define our relationship with products and retailers today ([Mintzberg, 1982](#)).

Early self-service grocery stores did not sell fresh meats or produce. 'Combination stores' selling perishable and non-perishable goods were developed in the 1920s. A definition of the supermarket emerged in the 1930s, as a combination store with self-service checkouts and with a floor area of 2,000 square feet or more ([Shaw et al, 2004](#)).

Michael J. Cullen has been credited with opening the very first supermarket, the 'King Kullen Grocery Company' in August 1930 ([Perlroth, 2009](#)). The proliferation of self-

service chains and the supermarket was rapid and widespread in North America, but it would not be until after the Second World War that self-service began to capture the UK market.

Post war (1945 - 1950)

The financial burden of two world wars and the extended rationing that ensued meant that the concept of self-service stores did not begin to take hold in the UK until after the Second World War (although the London Co-op ran a trial in 1942). By 1947, there were reportedly just ten self-service shops in the country ([Usherwood, 2000](#)). The newly elected Labour government, saddled with near bankruptcy, embarked upon a regime of social reform and austerity measures. The next six years saw Labour nationalise large swathes of infrastructure and industry, found the 'free for all' NHS and construct over a million new homes, 80% of them council houses ([Wheeler, 2015](#)). It also saw the dissolution of the British Empire, which had become prohibitively expensive to maintain. Despite such progressive intervention, the government's cautious fiscal policy was blamed for throttling economic growth and forcing prolonged restrictions on food purchasing ([Marwick, 1990](#)). Expansion of the self-service model so prolific in the US was modest in Britain's low growth climate. During the 40s, the self-service market was dominated by the London Co-operative, who by 1950 operated 90% of all the self-service stores in the UK ([Co-op, 2016](#)). Impatience with rationing and the slow economic recovery prompted the election of a more free-market-orientated Conservative government in 1951. The 'age of austerity' was over and Britain too was ready for a consumer revolution.

Late twentieth century (1950 - 2000)

Boom, bust and back again

Rationing finally ended in the UK in 1953. Buoyed by an inflow of migrants from the Commonwealth and regeneration funds injected from the US, Britain experienced an economic boom and a period of prosperity in the 50s and 60s. Between 1955 and 1960 average weekly earnings increased by 34% ([Jackson, 2002](#)). Low unemployment and increased disposable income facilitated modernisation (much of it imported from the US in the form of home technology, music and mass media). In grocery retail terms, this equated to expansion to self-service chain stores and the emergence and proliferation of the larger, combination store - the supermarket ([Jayasanker, 2008](#)).

In 1958, Tesco opened its first supermarket in Maldon, Essex. The store combined the self-service approach for non-perishable goods with a counter service selling cheese, butter and meats weighed by a sales assistant. Morrisons followed suit in 1961, opening its first supermarket in Bradford. The growth of the self-service really started to take off in the 1960s - Nielsen estimate that there were over 6,000 self-service outlets by 1960. By the end of the 1960s this had ballooned to 28,000, a growing proportion of which were the larger supermarket format ([The Nielsen Researcher, 1963](#)).

However, the economic boom was not to last. The 1973 oil crisis triggered a period of towering inflation, mass unemployment, riots, strikes and a property crash which defined Britain for much of the 70s and 80s. Unemployment rose above 2 million - its highest since 1938. It had reached 3 million by 1982 ([BBC News, 1982](#)). Despite this, the quality of life for most British families continued to improve throughout the 70s and sat in stark contrast to the experiences of families in austerity Britain following the Second World War.

[A] family of six, perched on a ration book dated 1951, give place to a family of four, wheeling a supermarket trolley full of provisions. ‘Consumerism’ – the growth of supermarkets, the availability of credit for the purchase of durable consumer goods, and, latterly the use of credit cards for the whole gamut of purchases from alcohol to dining-room suites – was indeed a central phenomenon of the age. The role of the family, whether nuclear or otherwise became an increasingly important centre of consumption from the 1950s onwards. ([Marwick, 1990](#))

Primarily in response to the choice afforded in self-service stores, family members became the targets of aggressive advertising campaigns - a feature that would come to dominate twentieth century consumption.

As the largest supermarket chains began to dominate the market their own-brand products began to feature heavily in product sales. By 1969, Sainsbury’s reported that 50% of their turnover came from own-brand goods ([Sainsbury’s, no date](#)).

As competition between retailers intensified, customer retention and brand loyalty came into focus. Green shield stamps which rewarded consumers for their loyalty were first introduced in the 1950s. Tesco (in association with dunnhumby) became the first supermarket chain to establish a nationwide loyalty card in 1995, when it launched Tesco Clubcard. As well as enticing customers to remain loyal to Tesco, in exchange for discounted products, this marked the upsurge in targeted, consumer-centric advertising and data analytics that would form the backbone of e-commerce in the early twenty-first century ([Humby, 2007](#)).

Table B.1: Big 4 UK store count by approximate floor area

Store size (Sq. ft)	Morrisons	Tesco	Sainsbury's	Asda
Convenience (<20,000)	153	2,772	870	-
Supermarket (20-60,000)	513	498	360	501
Superstore (>60,000)	-	250	74	32
Total	666	3,520	1,304	533

Source: Company financial reports

Undeterred by the economic and political climate, supermarket chains continued to grow in what was to become the beginning of intense competition between the (ever diminishing number of) market leaders. According to Neilson data, the market share of retailers with multiple stores increased from 44.3% in 1971 to 66.8% in 1983 ([Dawson, 2004](#)). The 80s and 90s saw swathes of mergers and acquisitions and new store formats including vast superstores added to retailers' portfolios. As retailers grew, their ability to monopolise the market with economies of scale and control over supply chains only perpetuated the trend ([Burt and Sparks, 2003](#)). Retailers were not only increasing the number of stores, but also increasing the size and standardising the presentation of each store. Tesco was particularly active in the consolidation, standardisation and expansion of its stores. By 1972 Tesco had 790 grocery stores, 518 of which were less than 5000sqft. By 1981, only 131 smaller stores remained. By 1980 they had 66 superstores of over 25,000 ft. By the mid-1990s this had rocketed to 264 ([Dawson, 2004](#)). [Table B.1](#) shows the approximate number of stores by size for the Big 4 supermarkets as at August 2015.

Rise of the machines: technological change in grocery shopping

Technological advancements also played a significant role on the shape of the grocery retail industry. According to ([Jackson, 2002](#)) car ownership rose by 250% between 1951

and 1961, making out-of-town shopping a viability and allowing retailers to site large, low rent (and thus low priced) stores in suburban locations.

Consumption practices were further transformed by the invention, and subsequent democratisation of the domestic home freezer. Around 4% of households had a deep-freezer in 1970, but this has ballooned to 41% by 1978 and with it, the consumption of frozen foods ([Marwick, 1990](#)).

Advancements in materials science also had a big impact on the freshness of food. By 1966, around a quarter of all bread was sold in plastic bags made of a new material, low-density polyethylene (LDPE). Pepsi patented the 2 litre plastic carbonated drinks bottle in 1973, which became possible with the development of polyethylene terephthalate (PETE) ([Risch, 2009](#)). The new packaging was not an instant success however – consumers expressed mistrust of pre-packaged perishable goods such as meat, fruit, vegetables and cheese. Nevertheless, self-service supermarkets did become by far the most frequented of stores, with a purported 90% of women using them ([IPC, 1970](#)).

Table B.2: UK household technology between 1960 and 2014

Year	Households (millions)	Cars per household	TVs per household	Households with internet
1960	16.3	0.30	0.67	-
1970	18.6	0.54	0.91	-
1980	20.2	0.73	0.99	-
1990	22.4	0.88	0.96	-
2000	23.9	0.97	1.01	25%
2010	25.0	1.08	1.04	73%
2014	26.7	1.06	0.98	86%

Source: Private cars registered in Great Britain, DVLA, DfT ([Prescott, 2006](#))

In 1982, Tesco introduced the UK's first electronic checkouts, the first of a multitude of electronic information technology to infiltrate grocery retailing; from the bar-code to

customer data collection; and eventually self-service tills and e-commerce (Jessen, 2012). The vital precursor to e-commerce also emerged during the 1980s - the expansion of the home-computer market. The market grew by 50% between 1982 and 1983 (Marwick, 1990) as the likes of Sinclair, Acorn, Amstrad, Apple and Microsoft vied to get a computer in every British home (see [Table B.2](#)).

Working women: social change affecting families and society

The economic boom of the 1950s and 60s marked an improvement in the quality of life for families across the UK, but also highlighted the disparity in pay and rights between men and women. Women's rights activists became increasingly active throughout the 1960s, culminating in the first National Women's Liberation movement who demanded equal pay, help with childcare and protection from domestic violence. By 1975 there were purportedly over 1,500 women's liberation groups who met on a regular basis ([Cochrane, 2010](#)). Women hosted strikes, marched and lobbied for reform resulting in the passing of the Equal Pay and Statutory Maternity provision Acts in 1970 and 1975 respectively.

The 1950s and 60s also saw the emergence of a new life-stage in the UK, that of the 'teenager'. Whilst young people had previously transitioned from childhood directly into adult roles and responsibilities, increased disposable income and prolonged compulsory education afforded young people the opportunity to develop their own cultural identities. Increased income also meant that young adults could afford to move in to their own homes at increasingly earlier ages marking a departure from the nuclear household. By the 1980s and 90s traditional views on homosexuality, divorce and single-parent families were also changing resulting in a diversification of the format of the household as a unit of consumption ([Turner, 2013](#)).

Twenty-first century (2000-present)

The twenty-first century UK grocery retail market took up where it had left off at the end of the twentieth century. The market leading retailers continued their rapid expansion, with particular growth in the superstore channel. The market continued to become more concentrated, with the Big 4 increasing their combined market share from around 65% in 2000 to 75% in 2010. Mergers and acquisitions subsumed some big players in the wake of market pressure and reorganisation. Somerfield (previously Gateway) enjoyed a market share of around 10% in the late 1980s, but this fell to around 4% before the ailing chain was purchased by the Co-operative Group (Co-op) in 2008 ([Ruddick, 2014a](#)). The Co-op have also seen their market share decrease from around 9% in 1980 to around 6% in 2015 ([Kantar World Panel, 2016](#)). The other major casualty of market consolidation was Safeway, who despite having an 11.3% market share in 2001, were acquired in 2004 by Morrisons ([Ruddick, 2014b](#)).

The large supermarket chains were enjoying year on year growth in profits, despite intense competition between retailers. Led by Tesco and Sainsbury's, the market also began to invest heavily in the convenience store format, with thousands of smaller stores popping up around the country ([Ruddick, 2015](#)).

The 2008 global financial crisis would play an enormous role in the reverse of fortunes for the Big 4, although it wasn't until 2011 that this became remarkably evident in end of year results. Price has always featured heavily in retailer's strategy to attract and retain customers, but never more so than in recent years - a period of austerity, low wage inflation and wide-ranging welfare cuts ([French, 2015](#)). The grocery retail industry has been widely described as 'racing to the bottom' with furious price competition resulting in an environment of food price deflation and the growth of discount stores such as Aldi and Lidl ([Allen, 2014](#)).

CDBE identified the rapid expansion of the Big 4's convenience stores as a significant reason for losing market share to discounters such as Lidl and Aldi ([Ruddick, 2014a](#)). It suggested that offering convenience stores has promoted the emerging culture of top-up shops, resulting in consumers diversifying their shopping across several retailers and using both online and offline channels, rather than completing one weekly shop. All of the Big 4 have halted the expansion of their convenience store business and Morrisons are sold 150 of its MLocal stores to Greybull Capital ([Hegarty, 2015](#)).

The Big 4 have also started to learn lessons from the success of their limited-range discounter rivals, so called because they stock fewer than 2,000 products. The discounters are thus able to negotiate the best prices for huge bulk orders and are not plagued by complex stock control management. The increased choices, once touted as way to increase consumer spend are now being reigned in - Tesco is looking to reduce its range from around 90,000 to around 65,000 products ([Wood, 2015](#)).

As the Big 4 retailers struggle to keep pace with the discounters, seventh largest retailer Waitrose has increased its share by offering an alternative proposition: quality, and ethical produce. They have made extensive use of their reputation to capitalise on sales of their own-brand offerings. Own-brand products have seen a rise in popularity across the market, with many consumers opting for own-brand premium products ahead of branded goods. Sales of premium own-brand products have reportedly outpaced overall grocery sales growth by a factor of four ([Nielsen, 2014](#)).

Technological changes have also featured heavily in the grocery sector in recent years (for both the consumer and the retailer). The (controversial) self-service tills have transformed the in-store experience of supermarket shopping, whilst the growth of online shopping has provided both threats and opportunities to the big retailers.

Unexpected item in bagging area

The early 2000s saw the beginning of an in-store revolution. As competition in the UK's saturated supermarket sector intensified, retailers looked for ways to make grocery shopping more efficient and less staff-intensive. The introduction of the self-service till promised the solution, just as the self-service supermarket had a century before. It was now (theoretically) possible to complete your grocery shopping without ever interacting with another human being. In fact, self-service tills have been highly divisive among consumers, some of whom find them irritating and unreliable. In fact, such is their fallibility that it has been estimated that around £1.6bn worth of produce is shoplifted a year (Johnston, 2014). These shortcomings seem not to have deterred retailers (or indeed consumers) from using the self-service till, with one notable exception - Morrisons has scrapped many of their machines after consulting with customers, replacing them with 10 items or fewer manned checkouts ([Neville, 2014](#)).

Self-scan or 'scan and go' technologies, where customers carry around barcode scanners and effectively process their shop as they go, have been less readily embraced by consumers ([Kaye, 2013](#)). It looks likely that this phase will re-emerge in the form of mobile scan and go although this has not yet significantly penetrated the market. The most significant web-based technology to impact the UK grocery market has undoubtedly been that of online shopping ([Butler, 2014](#)).

Online grocery shopping

The emergence of online grocery shopping had its origins in 1984, when Mrs Jane Snowball of Gateshead, England purchased groceries from her local Tesco store using Videotex ([Winterman, 2013](#)). However, it would be another five years before the web

was invented and it wasn't until the 2000s that online grocery shopping started to play a significant role in grocery consumption.

The late 90s was dominated by a flurry of e-commerce market entrants and (in hindsight) a great deal of investor overconfidence, culminating in the 'Dotcom bubble' (and subsequent crash) in 2001. The greatest casualties of this overconfidence in the online grocery market came from the US. HomeGrocer.com was seeded with \$100m from companies including Amazon.com and Martha Stewart, but overspent and sold out to competitor WebVan for \$1.2bn ([Kane, 1999](#); [Beltran, 2000](#)). WebVan subsequently went bankrupt in 2001 and has laid dormant under the auspices of Amazon ever since ([Reeves, 2011](#)).

These significant failures were attributed to low Internet saturation (around 36% of the US population were Internet users in 1999 (World Bank, 2015). Over expansion in tangible assets and spiralling staff costs were also cited – phenomena all too common during the Dotcom era, which also saw the UK's much hyped Boo.com (an online fashion retailer) fail catastrophically. Boo's failing lay not only in its overestimation of its consumer-base (only around 25% of UK households had Internet access in 2000 ([BBC News, 2000](#))), but also the overestimation of the Internet's infrastructure at the time. Domestic properties were serviced by dial-up Internet connections which proved insufficient to load the complex site. Furthermore, the download-able software required to run the site was not Mac compatible, excluding a significant proportion of their potential market ([Weill, 2001](#)).

Whilst UK online grocery retailing was more cautiously rolled out, it was not without issue. In 1998, Asda launched its online grocery presence, initially with a central depot model. Take up was not sufficient to cover costs however and Asda reverted to a store-pick model, as implemented by Tesco ([Youpsett, 2006](#)). Sainsbury's followed suit in

1999, in conjunction with Hewlett Packard ([Smith, 2008](#)). Ocado entered the market in 2000 ([Sky News, 2015](#)), becoming the first retailer to successfully deploy the central depot model ([Youpsett, 2006](#)). Initially Ocado delivered only Waitrose products but eventually expanded its own-brand offerings. It is the only major UK grocery retailer to succeed with this model, although it took until 2015 for the company to post profits ([Head, 2015](#)). Waitrose introduced its own home delivery service and in 2009, became the first grocery retailer to abolish all online shopping delivery charges, albeit for purchases over £50 ([Blackden, 2009](#)).

The mid 2000s saw smaller grocery retailers Riverford Foods and Dairy Crest's 'Milk & More' join the market ([Dairy Crest, no date](#)). Riverford Foods offer boxes of organic meat and seasonal vegetables, a category that appears to have benefited from the horse-meat scandal of 2013 and increasing tendency for consumers to top-up the main weekly shop ([Lucas, 2013](#)).

There was another flurry of activity in 2014, as Iceland re-launched its offering (following a failed attempt to enter the market in 1996 ([Iceland, no date](#))); and Ocado agreed a deal with Morrisons to manage the execution of their new online presence ([Hegarty, 2015](#)). The expansion of the online market continued into 2015, with Aldi announcing its intention to launch its own home delivery service and, perhaps most threatening of all, Amazon's proposed market entrance ([Spanier, 2015](#)). The prospect of such a retail powerhouse entering the sector is understandably unsettling for the current market leaders, but also has implications for the shape of grocery consumption more generally.

Online as a channel of grocery shopping is understudied, particularly the transformation of family dynamics, our relationship with food and ultimately, our consumption behaviour. As articulated by Marwick,

We can allocate people to different social classes, we can allocate them to different regions of the country, but fundamentally life was everywhere lived as a member of a family. ([Marwick, 1990](#))

With the enticement of an ever-increasing availability of consumer data, it is easy to underestimate the role of the household and other societal constraints in understanding evolving consumption behaviour. Grocery shopping (particularly food shopping) has some distinguishing features that make it unlikely that the market will move to a completely online model. Retailers have long known that we 'shop with our eyes', but the increasing use of online shopping challenges the importance of our tacit and embodied relationship with our food. Furthermore, mobile technologies pervade not only our homes, but also move with us, potentially reshaping the way we interact with our physical environment.

It would seem that for the time being at least, the home delivery model that has come to revolutionise e-commerce more generally (particularly in fashion, electronic goods and other non-perishables) is here to stay. Online purchases represented around 5% of family grocery purchasing as at 2013 and represents the channel of fastest growth for several of the big retailers ([Smithers Pira, 2013](#)). The challenge for retailers and academics alike rests in understanding how retailers and consumers are adapting and responding to online grocery shopping.

Appendix B: What is web science?

If you should happen upon a web scientist, you might be struck by how difficult it is to define just what they are and what they do. Web scientists; like the pioneers of science, philosophy and art; are not bound by a single discipline of expertise. Rather they draw upon a rich and disparate set of theories, methods and experiences with which they endeavour to learn more about our increasingly connected world.

If you should come across a second web scientist they might show little resemblance to the first. Web Scientists may have had formal education in mathematics or sociology, in law or psychology, in computer science, music or anthropology ([University of Southampton, 2016](#)). These are, but a few of the undergraduate disciplinary backgrounds of web scientists I know. What unites web scientists is their commitment to uncovering insights about the socially, legally, technologically, economically and culturally transformative phenomenon that is the World Wide web (the web). The web has transcended its role as a file sharing mechanism for eminent physicists ([CERN, no date](#)), infiltrating almost every facet of the lives of people in the developed and much of the developing world ([Harper, 2011](#); [ECS News 2014](#)).

Web scientists do not simply apply traditional techniques to the domain of the web, but rather they seek to develop new frameworks and techniques to understand how (or indeed whether) the web changes the way we experience and conduct our lives ([Berners-Lee et al, 2006](#)).

Appendix C: Morrisons 'coopetitive' relationship with Ocado

[Table C.1](#) shows the split of ownership between the Morrisons and Ocado following the deal.

Table C.1 : Split of ownership between Morrisons and Ocado

	Morrisons	Ocado
Hub – Dordon CFC	Morrisons Owned, part leased back to Ocado	
Warehouse technology in Dordon CFC	Morrisons owned, part leased back to Ocado	
Spokes – Regional	Joint venture	Joint venture
Website	Clone of Ocado, owned by Morrisons.com	
Vans, drivers	Drivers given training by Morrisons	Fleet owned and staffed by Ocado

Broadly, the details of the agreement were as follows:

- Morrisons paid around £170m to acquire the Dordon CFC and associated mechanical handling equipment ([BBC News, 2013](#)).
- Morrisons leases half of the Dordon CFC back to Ocado. Ocado uses the Dordon and Hatfield CFCs to deliver Waitrose and own brand products under the Ocado label ([Ruddick, 2013](#)).
- Morrisons invested around £46m further to expand the Dordon CFC and establish a series of regional 'spokes' to form a delivery network ([Morrisons, 2013](#)).
- Ocado provides the technology, warehouse, staff and Morrisons branded vans ([Ruddick, 2013](#)).

- Morrisons is responsible for customer marketing, pricing and delivering its product range to the Dordon CFC for distribution to consumers' homes ([Ocado, 2014](#)).

Morrisons stood to benefit from Ocado's experience and previous investment in technologies. By investing in Ocado infrastructure, they gained access to a functioning model and circumvented the need for R&D. Furthermore, the agreement stipulates that Morrisons will benefit from future Ocado technology developments ([Ocado, 2014](#)), such that Morrisons do not need to employ a permanent team to maintain the site infrastructure ([Brinded, 2015](#)). The ready-made infrastructure allowed Morrisons to move quickly, following incredibly late entrance to market. Going forwards, both companies could benefit from buying joint equipment in bulk and negotiating space allocation in the Dordon fulfilment centre during busier or quieter periods ([Byfield-Green, 2015](#)).

The deal contains a restrictive covenant, which prevents Ocado from providing a similar online grocery service to more than one competitor to Morrisons at any one time (i.e. it allows for arrangements to supply other retailers' products (e.g. Waitrose, Marks and Spencers), but no further expansion of Ocado's logistical service provision in the UK) ([BBC News, 2013](#)). This does not however prevent Ocado from entering other markets and CFO Tatton-Brown expects this will happen in the near future ([Farrell, 2014](#)).

Appendix D: Qualitative and quantitative methods

Data collection has been considered to fall into one of two camps for much of the last century - that of qualitative and quantitative research methods. Broadly speaking, quantitative research involves collecting numerical data from a sample containing large number of cases in a consistent and objective manner in order to find universal laws and make statistical generalisations to the population ([Taber, 2000](#)). In contrast, Qualitative research looks to study phenomena in their natural settings and focuses on the perspectives and meanings that participants bring to them ([Trumbull, 2005](#); [Creswell et al, 2003](#)). The researcher interacts with the participants in their own language and acknowledges that the participant and researcher co-construct the research. The approach often involves the collection of words and images through a variety of media such as interviews, ethnographies, life-stories and historical and photographic evidence.

A summary of the distinctions traditionally drawn between qualitative and quantitative methods is shown in [Table D1](#).

Table D.1: Traditional distinctions between qualitative and quantitative methods

	Qualitative	Quantitative
Dominant ontological position	Positivist — single objective truth	Interpretivist — multiple, subjective truths
Epistemological position	Empiricist, objective measurement	Rationalist, subjective co-creation
Generalisability	To population	Context specific, limited generalisation
Sample size	Large, generalisability via Central Limit Theorem	Typically small, depth of insight valued over generalisability
Data type	Typically numeric	Typically non-numeric

Adapted from Guba ([1994](#)), Taylor ([2005](#))

The desire to manipulate and control variables means that quantitative research is often conducted in experimental settings. Even when conducted in real-life settings, quantitative research is performed in a consistent, context-independent manner in order to ensure repeatability and the development of findings that can be generalised to the larger population ([Taylor, 2005](#)). In contrast, qualitative research prioritises observing actors in their natural settings in an attempt to interpret phenomena ‘in terms of the meanings people bring to them’ ([Trumbull, 2005](#)). In this way, qualitative research views phenomena as socially contingent upon the context in which they arise.

Whilst quantitative research advocates objectivity and minimal interaction with participants as a method of reducing bias and affecting outcomes; qualitative researchers suggest that a richer analysis can be drawn by interacting with participants on their own terms and in their own language ([Taylor, 2005](#)). For ethnographic research, this entails complete immersion in a social context, so that the researcher becomes an active participant within the social context being researched ([Dawson, 2009](#)). The major pros and cons of each approach is summarised in [Table D.2](#).

Table D.2: Pros and cons of quantitative and qualitative methods

	Pros	Cons
<i>Qualitative</i>	Can produce rich, complex data; can identify reasons and describe reasons for human behaviour	Subjectivity in coding; unknown reliability
<i>Quantitative</i>	Clear, discrete data produced; repeatability; known reliable	Inability to convey richness; does not explain process behind numbers

Adapted from Taylor (2005)

Quantitative research held a commanding position as the preferred research method for analysing human behaviour since the enlightenment up to the twentieth century ([Onwuegbuzie and Leech, 2005](#)) and remains dominant in the social sciences today ([Todd et al, 2004](#)).

Where quantitative methods lack power however, is in determining the reasons motivating and processes of enacting human behaviour. In online grocery shopping, quantifying which and how many of each product a consumer has purchased is simple; but understanding how the consumer came to make the decision, or identifying whether the selection of the product was optimal (it was the exact product the consumer wanted) or merely satisfactory (it was the best compromise) is difficult to establish without interrogating the situation with qualitative methods. The reasons and processes by which consumption behaviour is shaped by social context are difficult to reduce to a set of discrete, quantitative figures ([Goldkuhl, 2012](#)). This shortcoming of quantitative approaches is also discussed in the psychological sciences, where the inability to discretise emotions is readily acknowledged ([Bagozzi et al, 2002](#)). Where copious data have become available with the advent and expansion of the web, e-commerce and analytics, there has been resurgence in the focus on quantitative insights and a tendency to rely on quantitative analysis and statistical inference. Quantitative methods have shown themselves to be powerful tools consumer research ([Hunt, 1991](#)), but for the study of consumption practices at the level of the individual, there are some drawbacks in employing a quantitative-only approach:

- **Inappropriate generalisation** — one of the major advantages of quantitative methods is the power to generalise from the research sample to the whole population. This is powerful when describing broad change and populations at large but is less useful to an industry that has at its disposal individual level data. In order to understand behaviour at the level of the individual, insights from qualitative interviews can better supplement numerical findings than statistical methods that look to describe population level behaviour.
- **False causation** — identifying correlation and causation without an appreciation of social context can reveal misleading trends. Qualitative methods

provide a powerful ally in selecting which variables can be meaningfully correlated and whether there is any evidence for causation ([Nielsen, 2004](#)).

- **Missing the bigger picture** — tracking how consumers behave within the current online shop environment makes assumptions about the suitability of the platform for interfacing with the lives of individuals. Making fine tweaks to the timing and positioning of adverts by analysing numerical data may make small gains, but there is a great danger of missing a more fundamental human behaviour or preference observable through qualitative research that may leave such tinkering largely redundant.

Appendix E: Semi-structured interview guide

1. Can you explain to be when you joined the company and why you came to work here?
2. How would you describe Morrisons? What are its values, have these remained consistent?
3. Who are the company's customers? Has this / is this likely to change?
4. What do you see as the biggest successes of the business since you've been here?
5. What have been the greatest challenges to the business since you've been here?
6. What technological advancements have you seen whilst you've been at the company?
 - a. Which have been successful and why?
 - b. Which have been unsuccessful and why?
7. What do you think the pros and cons are for Morrisons joining the online grocery shopping market?
8. Do you think the customer base differs?
9. How do you think the company's values and messages are/can be conveyed online?
10. Do you think this will form a big part of Morrison's strategy going forwards?
 - a. If not, what will?

Appendix F: Interview selected quotes

Table F.1: Drivers of (and barriers to) digital transformation

Quote	ID	Emergent in-line code
If I'm loyal customer £500 a month with you but £100 online with Tesco because you don't have an online offer...why giving you that chance to move the whole lot to Tesco. (D9.2)	I4	Retaining customers
...you are the only one of the major multiples who were [sic] provoking your customer to shop elsewhere. Even if it is periodically they shop elsewhere, then they are getting a chance to try somebody else's ready meals or look at somebody else's pricing index or somebody else's promotions in depth. We were losing quite a lot to others.	I4	Retaining customers
It was only Dalton Phillips who kind of brought that we needed to be online.	I1	Reluctance to move online, driven by previous CEO
The trouble with online is it's hard to get massively motivated around it from a profit point of view.	I2	Difficult to make profit online
There's one reason you shop online, speed.	I1	Time poverty
What's more convenient than a one-hour slot, guaranteed full delivery?	I9	Convenience
...it's not like clothes...Amazon locker, you've got to be in...	I6	Inconvenient
Can I get my full food shop? Can I get non-food products like health and beauty and household and laundry? Can I get school-wear, can I get breadth is really important. And clearly, we do food, but we haven't got the full range online. I think customers expect to find what is in store online.	I3	Convenience, expectations
we're social animals and people want to interact, so they want to find somewhere to go to shop, eat, drink, live, talk, meet somebody.	I2	Social needs
I think you have to differentiate what attracts somebody to go to a store versus why they would stop going to a store because there's an online solution. And I think it comes down to the experiential element of it.	I2	Experiential needs

Table F.2: Strategic change during digital transformation

Quote	ID	Emergent in-line code
I think coming into it last, wasn't a bad thing. Because we learnt from everyone else's mistakes...lot of money, you know, some of our competitors, the things [they] got wrong, we haven't had that learning.	I7	Late to market, late mover advantage
Were we late in the market? Yes. Actually, is that a bad thing? I don't think it is. I think it was an opportunity for us to learn from everybody else's mistakes to be honest.	I3	Late to market, late mover advantage
there's no point being the last 'me too' in the market place.	I5	Late to market, no new customer value
what you have to do to maximise the advantage... learning very, very quickly what everyone else has taken ten years to learn... If you're late and great, it don't [sic] matter. If you're late and crap, don't bother. If you're late and 'me too', don't bother.	I5	Late to market, have to learn quickly
the online business in Morrisons is a very traditional grocer, it's not technology and online retailing, it isn't one of their core competences and they gave Tesco a 15-year head start and Tesco is very, very good	I5	Morrisons = traditional, not tech-savvy
first, last, middle it doesn't matter. What matters is what I said earlier which is you've got to create a value proposition for customers which is better than what they're experiencing currently, and you have to be able to communicate that fact very, very effectively. So first move advantage is only an advantage if you make it so, it's not a natural advantage.	I5	Order of entry not important – creating customer value is
because they were so late the quality of the real estate that they could get was probably not as good, and therefore the opportunity wasn't as good.	I5	Failed ventures - entry to convenience market
I don't think we'd spent enough time formulating what was the right proposition for convenience, and it was schizophrenic.	I2	Convenience poorly executed
and every time you picked up a paper it was the blundered takeover of Safeway. I look at it now, would Morrisons still have existed without those shops? No chance.	I2	Safeway acquisition
The Safeway bit was hard. If we'd tried to do online while we were doing that we'd have, we wouldn't have survived to be honest...should we have come earlier [to online market], probably, however, how would we have done it? We weren't big enough entity, we didn't have the skill-set, and actually...it [Safeway] was actually in distress. It wasn't doing great. So we had to do that recovery piece instead. So yeah, of course, but how could we have done, realistically?	I4	Couldn't enter online earlier, low technical skill-set
I don't think we had the capability both infrastructure and personnel...capacity in the business was taken up changing Safeway fascia to Morrisons' fascia, changing Safeway distribution network to Morrisons' distribution network, changing the Safeway range over to a Morrisons' range, which was a massive job.	I1	Low technical skill-set

I think anybody in hindsight would probably say, 'well maybe instead of binning it we should've parked it up in a cupboard somewhere to maybe utilise at a later date.'	I1	Lost technologies
I don't think we were ready for that level of technology either as a business, we were kind of not really technology savvy...weren't ready for a complete overhaul.	I2	Brand identity, technological capabilities
...our Achilles heel...has always been a strong technology backbone...I think we're beginning to build that strength in technology as the backbone now.	I2	Low technical skill-set, technological capabilities improving
In the past [we thought] innovations won't fly etc...we've grown up a bit and accepted the fact that you know, the market in the UK, the grocery market is going to change, the way people pay for their shopping is going to change, the easier you make it, whether it be in the store, whether it be online, the better.	I2	Market is changing, consumer practice is changing
maybe we could be leading with doing that...I don't think we've ever led with anything in technology ever...we've got people in the business now...who are far more forward thinking.	I2	Technological capabilities – no longer a barrier
I don't see these days technology as being a hold up for a lot of things. Whereas if you'd have asked me that ten years ago I'd have been going, 'oh we can't do that.'	I2	Technological capabilities – no longer a barrier
technology is a big challenge, because it is changing all the time...and will require investment.	I3	Technology is always changing technological change requires investment
Whereas you just type it in and it's like I know it'll be here tomorrow. Things like that, I can't see that that's going to stop.	I2	Convenience
How do you really stay in tune with what customers will want, and how their lifestyles are changing? And that could be by demographic, that could be my age group, and I think being clearer who we are targeting, so families versus retired versus young people who are our future customers and thinking/walking in their shoes and saying how do we make sure that we are super relevant.	I3	Consumers are changing
Elderly...he wants the butcher to do him half a pound of mince and put it in a little bag for him and take it away, because that's how they've traditionally shopped... [it's] the only conversation they're going to have all day, so it's really important.	I1	Social needs expectations
...a lot of elderly customers love self-scan as well surprisingly enough.	I1	Consumers are changing, - including older consumers
you've got to please both...I think more of the younger generation now are trending themselves towards some more personal service... [we] strive to... court more young customers.	I1	Personal service
I am now local solutions director which is one of our key priorities...I think thinks like click and collect is [sic] really important...that might be in our petrol stations...bit like Amazon lockers.	I3	Value proposition and unique selling points
popular and useful services across the business...we've got it online now where you can choose the thickness of your steak.	I1	Personalisation

I think when people try Morrisons in the south they are pleasantly surprised, because...really good value for money, and it is great quality, and it is fresh.	I3	Customer value proposition; value, quality, fresh
...we've got to work a way out at how online you bring Market Street to life... also recipes, meal solutions... we do listening groups weekly.	I1	Branding online, experiential needs
...but also get the feedback from the customer to what they need, what they're looking for. It's that bringing, - they do it for games - they get everybody hook-line and sinker and they're there aren't they - it's all virtual - how do you do that with fresh food?	I7	Experiential difficult for food
when we developed online it was very much from a what are the things that customers really want from online, and how do we make sure we do better than anybody else? ... But actually, if you are truly focused on customers, it is about giving them what they want, when they want, where they want.	I3	Customer value proposition
So there's something in that which is about the experiential element of it, which comes back to buying groceries is pretty boring but buying stuff that I want to buy that's interesting and different, I quite like that bit of it. So how do you get the right balance between those two things. Still, a lot of people are happy with just ordering it online and letting it come.	I2	Experiential
[we need to take] learning from others, online shopping experiences can be either great, or they can be a complete disaster.	I3	Experiential
I think having the leadership is really important. I think [the digital team] does a good job. And I think it's about when you start from scratch you are learning, but it is about how you take that learning and say okay, what do I do with it.	I3	Technological innovation requires good management
pop-up shops are all the craze... you're in town, you make your name, you're advertising...and flog the online basically... why wouldn't you?	I1	Pop-up shop = market awareness
Well Morrisons have got an existential problem that if Morrisons didn't exist would you bother creating it? You probably wouldn't ...because it has very little that is unique about it.	I5	Brand identity - no USP
I think the brand is the brand, and I think we should be very precious about our brand actually... So I think there is a whole load of stuff about how we present the information, but I think ultimately the Morrisons' brand is the Morrisons' brand. And I think the way that brand is shifting and the new presentation in terms of the logo, and the look and feel... it doesn't feel cheap and cheerful, it feels like a really good quality brand, but you have still got really good value.	I3	Brand identity needs to be maintained; value, quality
One thing we have which is major, major benefit for ourselves compared to competitors is the Market Street...don't have fully trained butchers, fully trained bakers, fully trained fishmongers.	I2	Brand identity, USP = trained staff
really important not to forget your heritage and not to forget your consumer promise as such, and always remember why customers want to shop with you.	I2	Brand identity needs to be maintained

So the heart of the company is all about service, it's about standards, it's about quality and it's about value, so we can't lose that.	I2	Brand identity, value, service
I think we have to be careful trying to run two brands... I'm not sure it's that easy to deliver nationally.	I2	Brand identity needs to be maintained across country
...it was a board of management that never really met as a full board of management, there was [sic] quite a few [board members].	I1	Morrisons team dynamics
There's a different feel in the senior team in the business, which I think is taking the business in the right direction.	I2	Morrisons team dynamics
It makes you understand the true worth of teamwork and how you gel together.	I1	Morrisons team dynamics
I think the other big trend is how we retain and manage our people... because places like West Yorkshire, hard to find the skills... nonsense about trendy hub in Shoreditch... skills are here, just getting them to want to work for corporate big supermarket is the challenge.	I9	Morrisons team dynamics; don't need to pander to faddish recruitment
How do we make sure that what we're delivering is fit for purpose for our colleagues?	I7	Morrisons team dynamics
There will always be a place in my mind, there will always be a place, and a need I would suggest, for the corner shop butcher.	I1	Truly local won't go away
I think it was a good move to partner with Ocado...there is no doubt they are the best at what they do. They needed volume, we needed route to market.	I2	Ocado deal
...but I did say to him at the time, why don't we just buy Ocado? ...would have cost us about 800 million assuming that they would have sold it of course... it would have been fairly cost-effective entry into online... [Ocado had the] most efficient online picking facility in the UK.	I2	Strategic opportunity missed
the level of sophistication and technology, I think it would have taken us years and years and years to build that and would have cost us lots and lots of money. So I do think taking advantage of their technology, and also their learning from Ocado, and clearly that is a good thing.	I3	Late to market, late mover advantage
No, it wasn't justifiable. I think the reason they got into it was Dalton, Dalton's final roll of the dice. But that deal was not justified on any measure, and I'm sure you know, when Andy and David opened the books on that deal they probably thought that was a really bad business decision.	I5	Ocado deal - unjustifiable
I think at the time it was probably the right thing to do. Would it be the right thing to do now, I genuinely don't know?	I3	Ocado deal – still fit for purpose?
I do recall actually saying to Dalton at one of the leadership meetings about 12 months before we did the deal with Ocado... if we didn't offer it [online] then we were almost like opening the door to others [competitors]... And that the money that you would have to invest in your core business to try and protect it from a move to online, even if you could stop it, would be disproportionate to actually operating online, even if it was loss making.	I2	Retaining customers, consumer demand driven

to do a deal differently than what anybody else has done and to go at it slightly differently, so I think that's a brave move.	I1	Innovative Ocado deal
From a sourcing point of view, they work with Waitrose; from fulfilment...share spokes...future spokes if aligned to both company's goals...It should be cheaper to run a joint business from a fulfilment point of view than a single business...being together even if our share is different is a good thing.	I9	Ocado deal – money saving?
So don't forget, the guy pushing the trolley through the front door is doing all the work for you... online customers, you're doing all the work... so actually you want to make sure... you look after very much the customers who's [sic] coming through the front door because they're doing all the work.	I1	Hub and spoke model vs store pick
[store pick] deprive[s] customers who are in your store...stuff on the shop floor could be short dated, so you don't get the best use by dates.	I3	Fresher food? Consumer value proposition, Store-pick deprives in-store customer
Substitutions...industry leading low.	I1	Low substitutions, consumer value proposition
I think the store-pick model is fraught with challenges. I come at it from a customer perspective, rather than a productivity and cost perspective. So I am sure the store pick model is more cost effective.	I3	Store-pick deprives in-store customer
When [the] new ordering system landed ...we're in a position where if we wanted to do store-pick we'd be in a very, very strong place.	I1	Store-pick hybrid; modernisation of ordering system
I'm not saying we shouldn't do a pick in store model, I'm saying if we do do it, we need to be very selective and we need to make sure that you've got a really robust stock system, because otherwise you will disappoint.	I1	Store-pick hybrid
Now clearly for us it lacks reach and therefore we will have to come up with a 'store-pick' solution...I often scratch my head when I go to somewhere like Nefyn in Wales [and see Tesco van, it can't be profitable.]	I2	Store-pick hybrid; choose where to use
I think Scotland is a massive opportunity for us, but I think Scotland to a degree will probably fall down to store-pick.	I1	Store-pick hybrid
I think it is one of the challenges we will face if we develop a store pick model is the branding piece. Because at some point, inevitably, your geography butts up against each other.	I4	Store-pick hybrid, brand identity and reputational implications
If I pick it, I might as well take the most cash for it... I'd rather sell one pack of four pack beans than four single cans, because it costs me four times as much to pick it...I don't sell loose products, because I can't handle them in the warehouse; I don't sell singles if I can sell a multiple; ultimately, we need to make the most money from a profitability point of view. Do I think that's ethical? It's how we make money. I think Morrisons customers would want us to be there for them.	I9	Multi-buy 'imperative' online

I think for us that is quite a smart move because becoming a wholesale partner to Amazon as they expand.	I5	Amazon partnership
Well all of a sudden, you're kind of available to a hell of a lot more customers, and whilst we're only doing a range at this point, I'm sure that will grow.	I1	Slow growth of range, expectations
Who would have thought that the discounters would be in the position that they are in today, even five/ten years ago? I don't think we have got a crystal ball.	I3	Competition, discounter strategy
It's their ability to buy and get it at the right price and distribute it the way they do that's really good.	I1	
price-perception kind of led from store experience. You were always judged on how good your service was, how good your availability was, how clean your shops were...when actually if you go into one of the discounters in the main your shopping trip's pretty, well it's not that enjoyable.	I1	Discounters = bad experience – can that last?
...because you look at Aldi's sales like-for-like and it's negative after a number of years of real positive growth, but it's now negative. If you look at Lidl's sales like for like that's still positive. Netto just announced they're closing [another] 22 shops; Netto are a discounter... Have they had their day?	I1	Discounters = bad experience – can that last?
I would probably be trying to build the manufacturing base they've got.	I5	Supply chain
clearly, being a supplier of your own business has got to be your number one priority.	I2	Supply chain
And if you get volume through your manufacturing you improve your efficiencies, you improve your yields, you make more profit...Where as if you've got a third party doing it you've got to cost...you bear the cost...We run our own cafes.	I1	Supply chain, cost saving
I think reaching out into different markets is something we continually look at.	I1	Customer value proposition
I think it's interesting your comments about these niche stores popping up, butchers you mentioned, which you're quite right. So the high street stores that basically were crushed by the supermarkets are beginning to re-surge, there's no doubt about it...Winning awards.	I1	Local resurgence? Experiential
We're currently assessing the 'Signature' range and reverting back to 'The Best' ...we moved it to Signature about four years ago... it was the wrong thing to do, 'The Best' was very popular.	I1	Brand identity, learning from mistakes
we're improving the product and increasing the range.	I1	Increasing range over time
the challenge for any ... online retailer is that you have to be transactionally brilliant in terms of the service that you offer. And the more that you are transactionally brilliant in the service that you offer the more you feel an emotional attachment to that thing.	I5	Experiential, customer-service, customer value proposition
I did Sainsbury's online, their online service was shocking.	I1	Customer service

great opportunity now that we've got technology more on our side to be competitive, so we're being more efficient and being able to invest in the consumer rather than invest in the bottom line.	I1	Technology increasing efficiency
I'm not sure we are necessarily worse off, I don't think we are better off.	I3	Compared to competitors
market has got more difficult for us and our competitors have opened more and more stores and we've sort of hollowed out a lot of our shops, plus we did open some, in a race-for-space under Dalton Philips, where we probably made some judgement errors in terms of locations, onerous leases, and forecasting the potential of those stores.	I2	Burden of physical stores
No, I think you can either back away and not be up for the fight, or you can put your gloves on and go and try and punch the daylights out of somebody, and I think that you know, that's what you need, you don't want to be on the front foot knowing damn well that you're going to get a couple in the ribs...but also, you're staying on your feet.	I1	Competitive market – surviving rather than thriving
It's not because those businesses have got worse, it's actually because your return rates have been diluted somewhat and that's the market we're in, it's the toughest market in Europe you know, grocery return in the UK.	I1	Competitive market – surviving rather than thriving
So the challenge for Morrisons is multiple; the first one is an existential question, the second one is the fact that it's late entry, the third one that they're not in control of their online business because of the relationship with Ocado, and then the final one is a one of economics ... but if you create an enhanced value proposition for customers in any business right, and people can understand what it is then you win, regardless of whether you're first, second or last into that market place. It doesn't matter if you were like the Co-op, the longest, who are the only retailer other than the discounters in growth at the moment yeah, or you've got the discounters which are relatively new.	I5	Value proposition key

F.3: Outcomes of digital transformation

Quote	ID	Emergent in-line code
...obviously we continue to expand the online stuff because we see massive growth in that and [are] very pleased with its current performance.	I2	Online growth
I think from an operational point of view and from a customer point of view I think we've done pretty good [sic] actually... we get more positives from customers than negatives, which says there's a big tick in the box. When I look at the numbers and I look at the volumes I go, 'tick in the box'. When I look at the size of the business now compare to, which started like two years ago, I go, 'tick in the box.'	I2	Happy customers, greater volumes, online growth
I think the most successful bits are the growth, speed of growth and the customer proposition, so regularly we have the best driver scores in the industry, better fulfilment than any of the other supermarkets by a huge margin because of the functionality we have got with Ocado.	I4	Online growth, happy customers, speed of growth
Our customer growth is growing year on year, I don't think many of the Big Four would be able to state that. Volume is coming back into the business.	I1	Online growth, greater volumes
Funnily enough our competitors are trying to follow this now, the doorstep check... so clearly, they see it as being an advantage.	I1	Competitors copying
I think my only criticism would be personally I would've liked to have gone wider, faster, larger distribution quicker.	I2	Too slow
I think reaching more people, more locations, because I think actually it can be quite frustrating [when you live in an area that we deliver to and travel to an area we don't].	I3	Expectations
I don't think Tesco, Asda or Ocado or Sainsbury's see Morrisons as a real and present threat to their own online business.	I5	No threat
Making money is the biggest challenge (for industry as a whole)... Tesco 4bn, 100m profit - few bits of smoke and mirrors; has said that making money online is one of his key fundamental goals; and they're the biggest player in the online market.	I5	Difficult to make money online
I think the competitor landscape may change, and there will be new entrants into the market.	I3	New entrants will come
...Amazon grow quietly in the background and once they have optimised it will boom.	I4	New entrants will come
Do you start your business with all that stuff [analytics], or do you just get going sell a load of stuff and catch up while the aeroplane's in the air?	I9	Technological capabilities
[Quoting Mike Jones:] I'd never give my marketing to anyone else but myself, just adding margin and not able to control spending.	I9	Technological capabilities
you can be that scientific about it that you can almost buy your sales.	I9	Technological capabilities
I don't know...how many coca colas sold from particular parts of the store. What my team are not doing is taking advantage of that.	I9	Technological capabilities

Technology has helped us to reinvent Morrisons' ordering and bring that in...it's a stronger wiser business now.	I1	Technological capabilities, Brand identity
I think technology is really important...how you engage in terms of the use of digital and mobile and Facebook and social media, and all the stuff of targeting people. So awareness is probably the biggest challenge. And I think actually doing that through digital is really, really important.	I3	Technological capabilities, engagement with customers
I think clearly showing product in its best form...quality of photography.	I3	Online branding, Experiential needs
Can we tell that tale strong enough? I'm sure we can. Can we get to be known in... where we've not got a shop, Morrisons is coming and everybody's looking forward to it? Well that's the job of the marketeers and they should be doing it.	I1	Online branding, Experiential needs
I think a lot of it is how we tell the story and get people to try us. I think that is the big challenge to be honest.	I3	Experiential, customer value proposition
What happens to acquisitional marketing spend; and spend on fulfilment network; what happens to delivery income; will be three of the big shifts in online grocery trade...but we will see.	I9	Logistics and digital marketing key to market
We're rubbish at that. So, we've got this Maserati, we're trying to tune the engine, it's like we've got an iron glove on. It doesn't work. So, overarching all of those three things - Basket size, composition, makeup, cannibalisation, devices and impact is how you trade the site. Better for customers, better economics. And the economics really come from that margin mix. The number of items that go in, and then the drop density. They are the three things that make a difference between making money and getting killed.	I8	Digital marketing, value of data not being exploited, technical capabilities eroded
Fresh is our point of difference, but really competitive prices. Will that be enough in the future?	I3	USPs – enough of a customer value proposition?
Not a lot...not sure if that's a good thing or not...Lot higher single income. Lost a few families. Part of that is geography. If you mapped demographic of UK to our demographic it's changed in line with that.	I9	Changing demographics? In line with nationally.
Eight years ago, we had a lot of our customers who were very, very loyal Morrisons' customers, they came and did their weekly shop, and you used to see really big trolley going around the shop... there is no such thing as a loyal customer any more...and I'm talking any of the supermarkets here, and a lot of the customers to brands.	I1	Customers disloyal, power shifting to consumer – distribution of agency
I don't feel like I'm loyal to it other than it delivers so therefore I'll carry on doing it while it delivers. As soon as it stops delivering I'm off. This is, sort of, how I feel we are, I don't think we're engaging massively.	I2	Customers disloyal, power shifting to consumer – distribution of agency
...because every business knows that a loyal customer base, like loyal customers are worth eight times more than unloyal [sic] customers, right.	I5	Loyal customers more valuable
You'll still have a primary supermarket in your mind...whilst you might shop three/four different supermarkets in the week somebody	I1	Still loyal to a point

will get your biggest shop...`If they go out with 97 [of the 100 items they wanted] and they've got to then go and call somewhere else you've become an inconvenience to them.		
It used to be the case ...that if we built a store people would come. That's not true anymore; I don't need to come to your store any more. So, you build a store, you've got to actively give me reasons to come otherwise I'm not going to bother.	I5	Real-estate no longer attracting customers
Clearly most people are time-poor in terms of they don't want to spend too long in shops, but where they can do the things they like doing.	I2	Experiential
Financial pressures were definitely a factor in the recession where the discounters got a grip, and all of a sudden you started seeing Bentleys on Aldi's car park, and it's a fact because the people with money are kind of really savvy with what they do with it.	I1	Price-sensitivity, price-savviness, value
Customers are far more price savvy these days because of the internet, because of mobile phones, because of price checker than they were eight/ten years ago.	I1	Power dynamics, technologies
Price is the driver for everything at this point, '[it's not] let's stick with British because it's British and we're on our own'; 'Bugger that, I'll have the cheap European pork, I'm sorry mate, I'd buy British but it's 50p a kilo more so I can't really afford it so I'm having the cheap European stuff.'	I1	Value
You can do that online, you can become very blinkered... once you've got your shopping list sorted, your shopping list's sorted, there's my shopping list.	I1	Stable baskets
The amount of people who pay contactlessly... you'll guaranty they'll pay contactlessly at a self-scan checkout where you don't have to do any work.	I1	Power dynamics - distribution of agency, convenience
breadth of range [and] great service, whether online or in store, ...competitively priced products...choice.	I3	Experiential, Value
But if you can create fantastic experiences in beautiful places then...and charge a price that is commensurate with the experience people will go. Places have changed based on technological advancement, societal psychology has changed hugely...and nobody's doing that today right, but that will have to come; that will have to come.	I5	Experiential needs
I think consumers are going to be more demanding, so as we get time-poor, even very savvy in terms of how they spend their cash...I think people will want things same day, I think they will want that level of convenience, and they will want 24/7 maybe.	I3	Expectations
...what's the biggest factor that would make you want to stop or change? Substitutions.	I1	Expectations
They just seem to have feeds of information, that social network of talking on the step has now become like...and it's like coming in from all angles, but they seem to keep each other informed much better.	I2	Engagement with customers, power dynamics – distribution of agency
they use web-chat, they use email, and that makes us a better business when we turn that information around, I think David [Potts, CEO] recognises that.	I9	Engagement with customers, power dynamics – distribution of agency

Appendix G: Focus groups key quotes

Table G.1: Representative quotes from focus groups and emergent codes

Quote	ID	Emergent code
I use it as my shopping list, so when I need something, so instead of writing it down on a piece of paper, I just put it straight into my basket.	FG1	Utility of technology, new practice
It could be like Amazon, you know, 'we see you make a lot of stir fries, have you tried this sauce' ...I don't mind that, it is a bit 'woo', but actually...it's nice to personalise it.	FG2	Privacy, data as transactional good
You can't see it before you buy, sometimes when I do my top-up, I do like to go into the supermarket and pick the fruit. Like bananas, I can't bare it, when you get bananas and they're already black and bruised.	FG3	Fresh, care
You do worry though, with whoever is picking it, our mindset is...a woman's thing, you do, you do look at the most green things... so maybe sometimes you think more care could be taken on things like fresh fruit and fresh.	FG4	Fresh, care, woman's skill
The way they pack it, rather than chucking everything on top of your fruit and veg, they could have it in a separate bag...the drivers sometimes just get it out and chuck it on the floor and your grapes could have been underneath the melon, and then they're totally squashed.	FG5	Fresh, care
I had a delivery last week, I had tonsillitis, I came to the door in my pyjamas and the bloke went, 'ooh dear, come on kiddies lets go in the other room for mummy and let's take the shopping in and where would you like it, is this close enough to the cupboards for you?', he was really, really nice and then when he left he said, 'I hope you feel better soon' ...he obviously loved his job, because he was very smiley.	FG6	Customer service
They never have anything new, I don't get excited... it just feels like the same thing week in, week out."	FG7	Boredom
...sometimes you get bored.	FG8	Boredom
I think they could have recipe ideas based on what you buy, or just a bit of inspiration."	FG9	Value added, inspiration for meal provision
I use online shopping because it's such a big shop to do, I just get bored and I just...it's like a template...tweak it.	FG10	Boredom, utility of technology, new practice
...meal plan, work out what we're gonna have for tea the next week and then devise a shopping list form that. It just got to a point where you can literally just put it in... I don't even look at the offers really online very often...	FG11	Utility of technology, new practice
It's that first shop takes time... just gonna take me ages.	FG12	Time-poor, high expectations

It really annoys me that - those types of things, it's almost like you're benefitting from being a new customer, and as an existing customer you're not, makes you feel like you're not valued.	FG13	Loyalty and being valued
Ocado keep giving me free gifts. I don't know whether it's because I shop a lot, or whether they do it with everybody...out of the blue...but yeah, it's nice.	FG14	Loyalty and being valued
I think sometimes when you shop online you expect that some of those things you're going to have to forego, because you are shopping online and personally, I think that, you know, that everything's going to be standard.	FG15	Compromise online
I wouldn't want that to be at the demise of anything else though ...the demise of delivery slots...	FG16	Compromise online
I wouldn't want the quantity of time slots sacrificed for just the half an hour time slot... I would want that choice, if you're not in until 9 o'clock at night be great to have that delivery then as opposed to everything stops at 6...	FG17	Compromise online
I don't think an hour's unreasonable...and to be honest they're usually early.	FG18	Compromise online
My son ordered something on a Saturday afternoon and said it was going to be here tomorrow. And I had this argument with him saying 'look, don't be so silly, it won't get here on a Sunday', I was like, 'no one delivers on a Sunday', and he was right. It came on a Sunday and I was absolutely shocked, and I was arguing with an 11 year old...I felt a right idiot.	FG19	High expectations
I just expected everything from the store [to be] online.	FG20	High expectations, expect full product range
No one like to pay up front for stuff...be nice of them to say, we've rewarded you with a smart pass for a month, so you can use that for the month of July and then you think, 'do you know what, I've got free delivery for the whole month', then that would make you order more.	FG21	Loyalty and being valued
I think a reward system would be better than saying you've got to pay this much up front for your deliveries.	FG22	Loyalty and being valued
...not at Christmas, but maybe throughout the year. It would be nice to have, 'you've shopped so much in the past few months, here's a free delivery slot, they could do some sort of incentive for you shopping there every week.	FG23	Loyalty and being valued
If you're happy with the product, why change?	FG24	Loyalty
also, with the fruit and veg when it's delivered it's always wrapped up, like the bananas are all bubble-wrapped...with Morrisons it's all fresh and it's kept nice.	FG25	Fresh, care
Morrisons people really happy, previously ASDA, miserable gits.	FG26	Customer service
You go on Waitrose website, I just feel good about shopping on that website.	FG27	Brand identity, quality, status

Table G.2: Emotive language use among focus group respondents

Positive	Frequency	Indifferent / negative	Frequency
really/very/most/quite	34	bother/ed	5
rather/more	33	annoyed/ing/s,spam	5
fresh/natural/healthy/butchers/seasonal/free	33	boring	3
want/like/important	26	moody	2
good/nice	21	old fashioned	2
polite/courtesy/helpful/honest/happy/friendly	16		
value	10		
easy	9		
posh/er,modern	5		
wider	5		
reward	2		
secure	2		
exciting	2		

Appendix H: Company financials

Table H.1: Weighted Average Cost of Capital (WACC)

	2013	2014	2015	2016	2017
Morrisons (%)	4.62	4.43	3.31	2.39	6.53
Tesco (%)	6.36	8.11	6.14	4.82	2.9
Sainsbury's (%)	6.01	6.63	4.98	2.4	2.26

Table H.2: Total assets

	2013	2014	2015	2016	2017
Morrisons (£m)	1,342	1,430	1,228	1,316	1,176
Tesco (£m)	13,096	15,572	11,958	14,684	15,417
Sainsbury's (£m)	12,695	16,540	16,537	16,973	19,737

Table H.3: Current liabilities

	2013	2014	2015	2016	2017
Morrisons (£m)	-2,334	-2,873	-2,273	-2,864	-2,755
Tesco (£m)	-18,703	-20,206	-19,805	-17,866	-19,234
Sainsbury's (£m)	-3,115	-6,765	-6,923	-6,720	-8,573

Table H.4: Net operating profit after tax (NOPAT)

	2013	2014	2015	2016	2017
Morrisons (£m)	647	-238	-761	222	305
Tesco (£m)	28	974	-5741	138	-40
Sainsbury's (£m)	602	716	-166	471	377

Table H.5: Operating profit / revenue 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Morrisons	6	5	6	5	-1	-4	2	3
Tesco	6	6	6	5	5	1	1	1
Sainsbury's	3	3	4	4	4	3	3	2
ASDA	5	4	4	4	4	4	5	4
Morrisons	6	5	6	5	-1	-4	2	3
Waitrose	5	5	5	5	4	3	2	3
Aldi	-1	1	4	4	5	4	3	2
Lidl	0	0	0	0	0	1	1	0
Co-op	5	5	4	3	3	3	3	3
Ocado	-4	0	0	1	0	1	0	2

*Revenue***Table H.6: UK revenue 2010 to 2017**

	2010	2011	2012	2013	2014	2015	2016	2017
Morrisons (£m)	15,410	16,479	17,663	18,116	17,680	16,816	16,122	16,317
Tesco (£m)	39,104	40,766	42,803	43,582	43,570	43,573	41,259	41,458
Sainsbury's (£m)	19,964	21,102	22,294	23,303	23,921	23,443	23,168	25,824
ASDA (£m)	19,836	20,546	21,848	22,843	23,325	23,232	22,375	21,666
Waitrose (£m)	4,317	4,700	5,072	5,314	5,641	6,016	5,967	6,121
Aldi (£m)	2,056	2,144	2,768	3,891	5,275	6,893	7,705	8,744
Lidl (£m)	168	183	203	212	245	296	344	419
Co-op (£m)	7,520	7,553	7,348	7,398	7,193	7,041	6,958	7,064
Ocado (£m)	402	516	598	679	792	949	11,076	1,271

Appendix I: Parliamentary constituency to YouGov region mapping

YouGov region	Parliamentary constituencies that make up region
East Anglia	Braintree Co Const, Clacton Co Const, Basildon and Billericay Boro Const, Brentwood and Ongar Co Const, Broadland Co Const, Bury St. Edmunds Co Const, Cambridge Boro Const, Castle Point Boro Const, Central Suffolk and North Ipswich Co Const, Chelmsford Boro Const, Colchester Boro Const, Epping Forest Co Const, Great Yarmouth Co Const, Harlow Co Const, Harwich and North Essex Co Const, Huntingdon Co Const, Ipswich Boro Const, Maldon Co Const, Mid Norfolk Co Const, North East Cambridgeshire Co Const, North Norfolk Co Const, North West Cambridgeshire Co Const, North West Norfolk Co Const, Norwich North Boro Const, Norwich South Boro Const, Peterborough Boro Const, Rayleigh and Wickford Co Const, Rochford and Southend East Co Const, Saffron Walden Co Const, South Basildon and East Thurrock Co Const, South Cambridgeshire Co Const, South East Cambridgeshire Co Const, South Norfolk Co Const, South Suffolk Co Const, South West Norfolk Co Const, Southend West Boro Const, Suffolk Coastal Co Const, Thurrock Boro Const, Waveney Co Const, West Suffolk Co Const, Witham Co Const
London	Mitcham and Morden Boro Const, Dagenham and Rainham Boro Const, Edmonton Boro Const, Westminster North Boro Const, Barking Boro Const, Battersea Boro Const, Beckenham Boro Const, Bermondsey and Old Southwark Boro Const, Bethnal Green and Bow Boro Const, Bexleyheath and Crayford Boro Const, Brent Central Boro Const, Brent North Boro Const, Brentford and Isleworth Boro Const, Bromley and Chislehurst Boro Const, Camberwell and Peckham Boro Const, Carshalton and Wallington Boro Const, Chelsea and Fulham Boro Const, Chingford and Woodford Green Boro Const, Chipping Barnet Boro Const, Cities of London and Westminster Boro Const, Croydon Central Boro Const, Croydon North Boro Const, Croydon South Boro Const, Dulwich and West Norwood Boro Const, Ealing Central and Acton Boro Const, Ealing North Boro Const, Ealing, Southall Boro Const, East Ham Boro Const, Eltham Boro Const, Enfield North Boro Const, Enfield, Southgate Boro Const, Erith and Thamesmead Boro Const, Feltham and Heston Boro Const, Finchley and Golders Green Boro Const, Greenwich and Woolwich Boro Const, Hackney North and Stoke Newington Boro Const, Hackney South and Shoreditch Boro Const, Hammersmith Boro Const, Hampstead and Kilburn Boro Const, Harrow East Boro Const, Harrow West Boro Const, Hayes and Harlington Boro Const, Hendon Boro Const, Holborn and St. Pancras Boro Const, Hornchurch and Upminster Boro Const, Hornsey and Wood Green Boro Const, Ilford North Boro Const, Ilford South Boro Const, Islington North Boro Const, Islington South and Finsbury Boro Const, Kensington Boro Const, Kingston and Surbiton Boro Const, Lewisham East Boro Const, Lewisham West and Penge Boro Const, Lewisham, Deptford Boro Const, Leyton and Wanstead Boro Const, Old Bexley and Sidcup Boro Const, Orpington Boro Const, Poplar and Limehouse Boro Const, Putney Boro Const, Richmond Park Boro Const, Romford Boro Const, Ruislip, Northwood and Pinner Boro Const, Streatham Boro Const, Sutton and Cheam Boro Const, Tooting Boro Const, Tottenham Boro Const, Twickenham Boro Const, Uxbridge and South Ruislip Boro Const, Vauxhall Boro Const, Walthamstow Boro Const, West Ham Boro Const, Wimbledon Boro Const
Midlands	Newark Co Const, Nottingham East Boro Const, Nottingham North Boro Const, Nottingham South Boro Const, Sleaford and North Hykeham Co Const, Warley Boro Const, Wellingborough Co Const, Lincoln Boro Const, Aldridge-Brownhills Boro Const, Amber Valley Co Const, Ashfield Co Const, Aylesbury Co Const, Banbury Co Const, Beaconsfield Co Const, Bedford Boro Const, Birmingham, Edgbaston Boro Const, Birmingham, Erdington Boro Const, Birmingham, Hall Green Boro Const, Birmingham, Hodge Hill Boro Const, Birmingham, Ladywood Boro Const, Birmingham, Northfield Boro Const, Birmingham, Perry Barr Boro

Const, Birmingham, Selly Oak Boro Const, Birmingham, Yardley Boro Const, Bolsover Co Const, Bosworth Co Const, Bromsgrove Co Const, Broxbourne Boro Const, Broxtowe Co Const, Buckingham Co Const, Burton Co Const, Cannock Chase Co Const, Charnwood Co Const, Chesham and Amersham Co Const, Chesterfield Boro Const, Corby Co Const, Coventry North East Boro Const, Coventry North West Boro Const, Coventry South Boro Const, Daventry Co Const, Derby North Boro Const, Derby South Boro Const, Derbyshire Dales Co Const, Dudley North Boro Const, Dudley South Boro Const, Erewash Co Const, Gedling Co Const, Grantham and Stamford Co Const, Halesowen and Rowley Regis Boro Const, Harborough Co Const, Hemel Hempstead Co Const, Henley Co Const, Hereford and South Herefordshire Co Const, Hertford and Stortford Co Const, Hertsmere Co Const, Hitchin and Harpenden Co Const, Kenilworth and Southam Co Const, Kettering Co Const, Leicester East Boro Const, Leicester South Boro Const, Leicester West Boro Const, Lichfield Co Const, Loughborough Co Const, Ludlow Co Const, Luton North Boro Const, Luton South Boro Const, Mansfield Co Const, Meriden Co Const, Mid Bedfordshire Co Const, Mid Derbyshire Co Const, Mid Worcestershire Co Const, Milton Keynes North Co Const, Milton Keynes South Boro Const, Newcastle-under-Lyme Boro Const, North East Bedfordshire Co Const, North East Derbyshire Co Const, North East Hertfordshire Co Const, North Herefordshire Co Const, North Shropshire Co Const, North Warwickshire Co Const, North West Leicestershire Co Const, Northampton North Boro Const, Northampton South Boro Const, Nuneaton Co Const, Oxford East Boro Const, Oxford West and Abingdon Co Const, Redditch Co Const, Rugby Co Const, Rushcliffe Co Const, Rutland and Melton Co Const, Sherwood Co Const, Shrewsbury and Atcham Co Const, Solihull Boro Const, South Derbyshire Co Const, South Holland and The Deepings Co Const, South Leicestershire Co Const, South Northamptonshire Co Const, South Staffordshire Co Const, South West Bedfordshire Co Const, South West Hertfordshire Co Const, St. Albans Co Const, Stafford Co Const, Staffordshire Moorlands Co Const, Stevenage Co Const, Stoke-on-Trent Central Boro Const, Stoke-on-Trent North Boro Const, Stoke-on-Trent South Boro Const, Stone Co Const, Stourbridge Boro Const, Stratford-on-Avon Co Const, Sutton Coldfield Boro Const, Tamworth Co Const, Telford Boro Const, The Wrekin Co Const, Walsall North Boro Const, Walsall South Boro Const, Warwick and Leamington Boro Const, Watford Boro Const, Welwyn Hatfield Co Const, West Bromwich East Boro Const, West Bromwich West Boro Const, West Worcestershire Co Const, Witney Co Const, Wolverhampton North East Boro Const, Wolverhampton South East Boro Const, Wolverhampton South West Boro Const, Worcester Boro Const, Wycombe Co Const, Wyre Forest Co Const

North East	Berwickshire, Roxburgh and Selkirk Co Const, Sunderland Central Boro Const, Berwick-upon-Tweed Co Const, Bishop Auckland Co Const, Blaydon Boro Const, Blyth Valley Boro Const, City of Durham Co Const, Darlington Boro Const, Easington Co Const, Gateshead Boro Const, Hartlepool Boro Const, Hexham Co Const, Houghton and Sunderland South Boro Const, Jarrow Boro Const, Middlesbrough Boro Const, Middlesbrough South and East Cleveland Co Const, Newcastle upon Tyne Central Boro Const, Newcastle upon Tyne East Boro Const, Newcastle upon Tyne North Boro Const, North Durham Co Const, North Tyneside Boro Const, North West Durham Co Const, Redcar Boro Const, Sedgefield Co Const, South Shields Boro Const, Stockton North Boro Const, Stockton South Boro Const, Tynemouth Boro Const, Wansbeck Co Const, Washington and Sunderland West Boro Const
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North West	Workington Co Const, Penrith and The Border Co Const, Carlisle Boro Const, Copeland Co Const, Barrow and Furness Co Const, Westmorland and Lonsdale Co Const, Tatton Co Const, Weaver Vale Co Const, Congleton Co Const, Crewe and Nantwich Co Const, Eddisbury Co Const, Ellesmere Port and Neston Co Const, Preston Boro Const, Macclesfield Co Const, Halton Co Const, Altrincham and Sale West Boro Const, Ashton-under-Lyne Boro Const, Birkenhead Boro Const, Blackburn Boro Const, Blackley and Broughton Boro Const, Blackpool North and Cleveleys Boro Const, Blackpool South Boro Const, Bolton North East Boro Const, Bolton South East Boro Const, Bolton West Co Const, Bootle Boro Const, Burnley Boro Const, Bury North Boro Const, Bury South Boro Const, Cheadle Boro Const, Chorley Co Const, City of Chester Co Const, Denton and Reddish Boro Const, Fylde Co Const, Garston and Halewood Boro Const, Hazel Grove Co Const, Heywood and Middleton Co Const, Hyndburn Boro Const, Knowsley Boro Const, Lancaster and Fleetwood Co Const, Leigh Co Const, Liverpool, Riverside Boro Const, Liverpool, Walton Boro Const, Liverpool, Wavertree Boro Const, Liverpool, West Derby Boro Const, Makerfield Co Const, Manchester Central Boro Const, Manchester, Gorton Boro Const, Manchester, Withington Boro Const, Morecambe
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	and Lunesdale Co Const, Oldham East and Saddleworth Co Const, Oldham West and Royton Boro Const, Pendle Boro Const, Ribble Valley Co Const, Rochdale Co Const, Rossendale and Darwen Boro Const, Salford and Eccles Boro Const, Sefton Central Co Const, South Ribble Co Const, Southport Boro Const, St. Helens North Boro Const, St. Helens South and Whiston Boro Const, Stalybridge and Hyde Co Const, Stockport Boro Const, Stretford and Urmston Boro Const, Wallasey Boro Const, Warrington North Boro Const, Warrington South Boro Const, West Lancashire Co Const, Wigan Co Const, Wirral South Co Const, Wirral West Co Const, Worsley and Eccles South Co Const, Wyre and Preston North Co Const, Wythenshawe and Sale East Boro Const
South coast	Wantage Co Const, Wokingham Co Const, Newbury Co Const, Reading East Boro Const, Reading West Co Const, Slough Boro Const, Bracknell Co Const, Windsor Co Const, Maidenhead Co Const, Bournemouth East Boro Const, Bournemouth West Boro Const, Mid Dorset and North Poole Co Const, Poole Boro Const, South Dorset Co Const, Aldershot Boro Const, Arundel and South Downs Co Const, Ashford Co Const, Basingstoke Boro Const, Bexhill and Battle Co Const, Bognor Regis and Littlehampton Co Const, Brighton, Kemptown Boro Const, Brighton, Pavilion Boro Const, Canterbury Co Const, Chatham and Aylesford Co Const, Chichester Co Const, Christchurch Co Const, Crawley Boro Const, Dartford Co Const, Dover Co Const, East Hampshire Co Const, East Surrey Co Const, East Worthing and Shoreham Co Const, Eastbourne Boro Const, Eastleigh Boro Const, Epsom and Ewell Boro Const, Esher and Walton Boro Const, Fareham Co Const, Faversham and Mid Kent Co Const, Folkestone and Hythe Co Const, Gillingham and Rainham Boro Const, Gosport Boro Const, Gravesham Co Const, Guildford Co Const, Hastings and Rye Co Const, Havant Boro Const, Horsham Co Const, Hove Boro Const, Isle of Wight Co Const, Lewes Co Const, Maidstone and The Weald Co Const, Meon Valley Co Const, Mid Sussex Co Const, Mole Valley Co Const, New Forest East Co Const, New Forest West Co Const, North East Hampshire Co Const, North Thanet Co Const, North West Hampshire Co Const, Portsmouth North Boro Const, Portsmouth South Boro Const, Reigate Boro Const, Rochester and Strood Co Const, Romsey and Southampton North Co Const, Runnymede and Weybridge Co Const, Sevenoaks Co Const, Sittingbourne and Sheppey Co Const, South Thanet Co Const, South West Surrey Co Const, Southampton, Itchen et al Boro Const, Southampton, Test Boro Const, Spelthorne Boro Const, Surrey Heath Co Const, Tonbridge and Malling Co Const, Tunbridge Wells Co Const, Wealden Co Const, Winchester Co Const, Woking Co Const, Worthing West Boro Const
West country	Somerton and Frome Co Const, North Dorset Co Const, West Dorset Co Const, Camborne and Redruth Co Const, Central Devon Co Const, East Devon Co Const, Exeter Boro Const, Newton Abbot Co Const, North Cornwall Co Const, North Devon Co Const, Plymouth, Moor View Boro Const, Plymouth, Sutton and Devonport Boro Const, South East Cornwall Co Const, South West Devon Co Const, St. Austell and Newquay Co Const, St. Ives Co Const, Taunton Deane Co Const, Tiverton and Honiton Co Const, Torbay Boro Const, Torridge and West Devon Co Const, Totnes Co Const, Truro and Falmouth Co Const, Yeovil Co Const
Yorkshire	High Peak Co Const, Bassetlaw Co Const, Wentworth and Dearne Co Const, Penistone and Stocksbridge Co Const, Skipton and Ripon Co Const, Rother Valley Co Const, Rotherham Boro Const, Scarborough and Whitby Co Const, Selby and Ainsty Co Const, Thirsk and Malton Co Const, Haltemprice and Howden Co Const, Harrogate and Knaresborough Co Const, Don Valley Co Const, Great Grimsby Boro Const, Kingston upon Hull East Boro Const, Kingston upon Hull North Boro Const, Kingston upon Hull West and Hessle Boro Const, Beverley and Holderness Co Const, Brigg and Goole Co Const, Cleethorpes Co Const, Doncaster Central Boro Const, Doncaster North Co Const, East Yorkshire Co Const, Scunthorpe Co Const, Barnsley Central Boro Const, Barnsley East Co Const, Batley and Spen Boro Const, Boston and Skegness Co Const, Bradford East Boro Const, Bradford South Boro Const, Bradford West Boro Const, Calder Valley Co Const, Colne Valley Co Const, Dewsbury Co Const, Elmet and Rothwell Co Const, Gainsborough Co Const, Halifax Boro Const, Hemsworth Co Const, Huddersfield Boro Const, Keighley Co Const, Leeds Central Boro Const, Leeds East Boro Const, Leeds North East Boro Const, Leeds North West Boro Const, Leeds West Boro Const, Louth and Horncastle Co Const, Morley and Outwood Co Const, Normanton, Pontefract and Castleford Co Const, Pudsey Boro Const, Richmond (Yorks) Co Const, Sheffield

	Central Boro Const, Sheffield South East Boro Const, Sheffield, Brightside and Hillsborough Boro Const, Sheffield, Hallam Co Const, Sheffield, Heeley Boro Const, Shipley Co Const, Wakefield Co Const, York Central Boro Const, York Outer Co Const
Wales and Avon	Weston-Super-Mare Co Const, Wells Co Const, Bridgwater and West Somerset Co Const, The Cotswolds Co Const, Tewkesbury Co Const, Stroud Co Const, Gloucester Boro Const, Forest of Dean Co Const, Cheltenham Boro Const, Salisbury Co Const, Bath Boro Const, Bristol East Boro Const, Bristol North West Boro Const, Bristol South Boro Const, Bristol West Boro Const, Filton and Bradley Stoke Co Const, Kingswood Boro Const, North East Somerset Co Const, North Somerset Co Const, Thornbury and Yate Co Const, Weston-super-Mare Co Const, Chippenham Co Const, Devizes Co Const, North Swindon Co Const, North Wiltshire Co Const, South Swindon Co Const, South West Wiltshire Co Const, Aberavon, Aberconwy, Alyn and Deeside, Arfon, Blaenau Gwent, Brecon and Radnorshire, Bridgend, Caerphilly, Cardiff Central, Cardiff North, Cardiff South, Cardiff West, Carmarthen East and Dinefwr, Carmarthen West and South Pembrokeshire, Ceredigion, Clwyd South, Clwyd West, Cynon Valley, Delyn, Dwyfor Meirionnydd, Gower, Islwyn, Llanelli, Merthyr Tydfil and Rhymney, Monmouth, Montgomeryshire, Neath, Newport East, Newport West, Ogmore, Pontypridd, Preseli Pembrokeshire, Rhondda, Swansea East, Swansea West, Torfaen, Vale of Clwyd, Vale of Glamorgan, Wrexham, Ynys Môn (Anglesey)
Central Scotland	Dumfries and Galloway Co Const, Dumfriesshire, Clydesdale and Tweeddale Co Const, Airdrie and Shotts Co Const, Coatbridge, Chryston and Bellshill Burgh Const, Cumbernauld, Kilsyth and Kirkintilloch East Co Const, East Dunbartonshire Co Const, East Kilbride, Strathaven and Lesmahagow Co Const, East Renfrewshire Co Const, Edinburgh East Burgh Const, Edinburgh North and Leith Burgh Const, Edinburgh South Burgh Const, Edinburgh South West Burgh Const, Falkirk Co Const, Glasgow Central Burgh Const, Glasgow East Burgh Const, Glasgow North Burgh Const, Glasgow North East Burgh Const, Glasgow North West Burgh Const, Glasgow South Burgh Const, Glasgow South West Burgh Const, Inverclyde Co Const, Kilmarnock and Loudoun Co Const, Lanark and Hamilton East Co Const, Linlithgow and East Falkirk Co Const, Livingston Co Const, Midlothian Co Const, Motherwell and Wishaw Burgh Const, Paisley and Renfrewshire North Co Const, Paisley and Renfrewshire South Co Const, Rutherglen and Hamilton West Burgh Const, Stirling Co Const, West Dunbartonshire Co Const, Argyll and Bute Co Const, Ayr, Carrick and Cumnock Co Const, Central Ayrshire Co Const, North Ayrshire and Arran Co Const, East Lothian Co Const, Edinburgh West Burgh Const
Northern Scotland	Ross, Skye and Lochaber Co Const, Dundee East Burgh Const, Dundee West Burgh Const, Aberdeen North Burgh Const, Angus Co Const, Dunfermline and West Fife Co Const, Glenrothes Co Const, Inverness, Nairn, Badenoch and Strathspey Co Const, Ochil and South Perthshire Co Const, Perth and North Perthshire Co Const, Caithness, Sutherland and Easter Ross Co Const, Ross, Skye and Lochaber Co Const, Moray Co Const, Orkney and Shetland Co Const, Na h-Eileanan an Iar Co Const, West Aberdeenshire and Kincardine Co Const, Banff and Buchan Co Const, Gordon Co Const, Kirkcaldy and Cowdenbeath Co Const, North East Fife Co Const, Aberdeen South Burgh Const

Appendix J: Ethics approval

This thesis was approved by the University of Southampton ethics board via the Ethics and Research Governance Online (ERGO) portal. The ERGO reference numbers for the approval are 17708, 19949 and 20887.

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