Tell me what that means to you: Small-story narratives in technology adoption *

Brian Pickering[1 [0000−0002−6815−2938]], Stephen C Phillips[1 [0000−0002−7901−0839]], and Mike Surridge[1 [0000−0003−1485−7024]]

Electronics and Computer Science, IT Innovation, University of Southampton, Gamma House, Enterprise Road, Southampton SO16 7NS, UK
{j.b.pickering,s.c.phillips,ms8}@soton.ac.uk

Abstract. Technology adoption is often predicted based on little information such as the *Perceived ease-of-use* and the *Perceived usefulness* of the technology. Related constructs such as *Attitude to use*, *Behavioral intention to use* and *External variables* cannot be easily operationalised and so are often ignored. However, technology characteristics themselves fail to represent other factors such as potential adopter attitudes and how they react to the opportunities offered by the technology to meet their needs. In a series of three studies, qualitative methods were used to identify, validate and then exploit narrative themes. Based on the short narratives of potential adopters discussing their experiences with a set of cybersecurity tools, we are developing a small-story narrative framework to capture how they respond to the technology contextualised directly within their professional environment. Akin to concepts from adoption frameworks in healthcare intervention studies, we conclude that adopter's personal response to a technology and how they make sense of it in their environment becomes evident in the narratives they create.

Keywords: Technology acceptance · Technology adoption · Mixed methods · Qualitative methods · Narrative analysis · Grounded theory · Small-story narratives

1 Introduction

Causal models provide an elegant conceptualisation to explain the intention to act [1–3], even to adopt technology [4]. Their simplicity and apparent robustness may account for their continued attraction [5]. In the case of technology acceptance, the primacy of *Perceived ease-of-use*, though contested [6, 7], is bolstered by the robustness of similar instruments such as the *System Usability Scale* [8, 9]. With technology, and despite the introduction of some contextual and user perspectives [10], the assumption is largely that features of the technology itself

* This work was supported by the EU H2020 project CyberKit4SME (Grant agreement: 883188); and in part by the FogProtect project, a Horizon 2020 Research and Innovation Action to secure sensitive data along the computing continuum (under grant agreement No 871525).

such as ease of use are enough to predict user adoption. However, other models such as the *Health Belief Model* [11] in healthcare and *Protection Motivation Theory* [12] introduce user perceptions and projected self-efficacy alongside aspects of the technology or intervention, bringing the human dimension to the fore [13]. Interestingly, software development practice has attempted to include a user perspective explicitly via user stories [14] or even interviews [15] to elicit requirements and scenario testing [16] so as to explore the likelihood that a technology would meet those requirements. Whether meeting requirements is enough to ensure acceptance is a moot point. Approaches like *Diffusion of Innovations* [17] would suggest that contextual information, including communication channels and adopter readiness, is equally important. Similarly, frameworks such as *Non-adoption, Abandonment, Scale-up, Spread and Sustainability* (NASSS) [18] and *Normalisation Process Theory* (NPT) [19] in healthcare include stakeholder perspectives, engagement and common action involving potential users and developers to encourage adoption and sustainability for the technology or intervention.

In so doing, these frameworks foreground potential user perceptions when engaging with a technology and the broader context of its use rather than assuming that features of the technology itself are sufficient to guarantee ongoing use. Identifying those perceptions and attitudes when using technology needs some thought. Standard instruments, for instance, may not capture this information and may even be misleading. For instance, we have previously reported qualitative research highlighting apparent contradictions between quantitative measures of acceptability and potential adopters' perceptions of technology [20, 21]. Nonetheless, although quantitative instruments appear robust [8, 9], there is some scope to refine these instruments on the basis of user expectations and demographic characteristics [9]. Further, it has been known for some considerable time that participants in experimental or test settings may second-guess what they are being asked to do and therefore perform to please the questioner rather than report their own responses truthfully and don't necessarily target the right issues and individuals [22, 23]. One method to overcome any such issues involves a mixed-methods approach: using qualitative methods alongside and to supplement findings from quantitative instruments. The purpose of the present study is to attempt to identify a qualitative research approach to allow users to articulate their experience with technology in a meaningful way for developers and service providers to understand the real effectiveness of their technology or service. This would then complement results from traditional quantitative methods to provide a comprehensive view of the relevance of a technology and its ultimate adoption.

2 Background

To work around potential artificiality with quantitative surveys, ethnographic studies, whereby potential adopters are observed while interacting with a given technology, are employed to understand technology use and applicability within

a specific context [24]. This approach has already provided valuable insight into technology adoption [25] as well as power relations in virtual communities [26] and even research contexts [27]. Observing potential adopter behaviours in this way may identify potential adopters' responses to technology in the context of their own and socially constructed narratives.

A think-aloud protocol typically addresses actual use and experience with a technology, rather than more general perceptions and attitudes towards its adoption. By contrast, narrative approaches specifically would provide users an opportunity to relate their specific use and experience of a technology as part of a think-aloud protocol [28]. Narrative psychology assumes that we tell *stories* to make sense of our experience [29]. These stories tend to order relevant events temporally or by importance and may be *progressive* (our goals are satisfied), *regressive* (our goals are frustrated), or *stability* narratives (we set out what's happened without reference to goal achievement) [30]. More generalised narrative approaches focus on the structure and content of the *stories* we tell to make sense of our lives and environment [29, 31], rather than specific technology-mediated activity. As opposed to life-course descriptions, small-story narratives emphasise naturally occurring "narratives-in-interaction" [32, 33]. Through such interactions, the adopter begins to *make sense* of how the technology might benefit them.

Specifically, where technology is potentially disruptive - changing processes and requiring user adaptation - small stories may provide an insight into adopter perceptions developed as a response to technology affordances [34]. In personalising their experiences and recognising the relevance of technology adoption specific to them, self-efficacy – that is the belief that one is able to manage better, in this context, by using technology – increases. This encourages further exploration, and even a willingness to overlook some of the shortcomings of the technology in its present state [35, 36]. Indeed, self-efficacy has also been shown to affect trust in that technology as well as adoption and sustained use [37].

In the present study, we explore a small-story narrative approach to evaluate responses to cybersecurity technologies which model socio-technical systems and identify associated risks and mitigations [38], and formalise the customer journey through typical work activities [39]. Specifically, we attempt to formalise a research approach to elicit potential adopter small-story narratives indicative of an intention to adopt.

This research is based on three separate interactions over a period of time with potential users of one or both of the cybersecurity technologies cited. The first involves nine employees with different roles of a medium-sized UK-based Small-to-medium enterprise (SME) responsible for secure data handling solutions to public authorities. The second involved four EU-based SMEs directly validating the cybersecurity technologies. The same four EU-based SMEs were approached again along with another EU-based project and three more SMEs, making seven in total.

3 Method

Three separate studies were run. *Study 1* and *Study 2* involved a review of standard interactions between developers and potential adopters. More precisely, the first involved a secondary analysis of recordings from a *workshop*, and the second was a secondary analysis of recordings from meetings where participants discussed the technologies as part of *technology validation*. The recordings had not been made specifically for ethnographic research therefore. *Study 3* was explicitly designed to elicit a narrative relating to the potential adopters' experience with the technologies in question. *Study 1* provided the initial impetus to explore narratives of technology adoption, leading to *Study 2* where the results of the previous analysis were validated, and *Study 3* sought to test that the assumptions from *Studies 1* and *2* could be generalised elsewhere.

3.1 Study 1: *Workshop*

During a one-day workshop, the nine SME employees were shown one of the technologies and asked to develop a model of a socio-technical system highlighting potential cybersecurity threats and mitigations. Towards the end of the workshop and after hands-on experience of the technology to develop the model, there was a final session during which attendees were simply asked to discuss their experience using the technology. Recordings were analysed applying a combination of narrative analysis [30] to identify how participants responded to the technology, and thematic analysis and grounded theory [40, 41] to develop a coding scheme for subsequent interactions. This work was approved by the faculty ethics committee (ERGO/FEPS/46678).

3.2 Study 2: *Technology Validation*

The second study comprised recordings from a series of project status meetings. There were four SMEs in total working across finance, utilities, healthcare and automotive sectors. Four end-users, one from each SME, were asked during the initial sessions to describe their basic operations and their expectations from the cybersecurity technologies. A second set of recordings was an annual status update approximately a year later, when the SMEs had some experience of the technologies in question. This work was approved by the faculty ethics committee (ERGO/FEPS/62067).

3.3 Study 3: *Protocol Validation*

The third and final phase for this exploratory study sought to validate the observations and data-driven findings from the first two. Seven SMEs were approached, four from *Study 2* and a further three from a different collaborative project. The three additional SMEs operate in manufacturing, broadcasting and safe-city technologies. As a grounded theory approach, data were explicitly collected with a view to using the codes identified in *Study 1* and validated in *Study*

2 as the basis for a research instrument. This consisted of three open-ended questions (see below in Section 4.1), each with a secondary prompt to encourage more discursive input. In order to reduce the burden on participants and in the hope of speeding up data collection, participants were given the choice to respond in writing to the questions using 100-200 words or attend a short, online meeting of around 30 to 45 minutes with one of the researchers (BP) based around the same three open-ended questions as part of a semi-structured interview. This work was approved by the faculty ethics committee (ERGO/FEPS/70387).

4 Results

4.1 Study 1: *Workshop*

An initial thematic analysis of the transcripts yielded thirty-three functional and non-functional requirements across seven different areas. Although not a typical data collection exercise for narrative analysis, once particular issues with the technology and the potential adopters' perceptions including concerns around perceived usability had been discussed, several employees began to develop their own narratives specific to personal benefits they might derive by using the technology. These narratives were analysed in terms of structure, coherence and identity development in the first instance.

The following extract occurs over many minutes. The participant (P1.7) kept coming back to their original point despite several other turns in the conversation.

> P1.7: *A year ago we had some pen testing on the* [PRODUCT] *and there was a bug report raised, 'please implement this' and I was looking at that and saying, hang on, this has got bad side effects, how do we deal with making decisions whether to implement this or not ... you're quite right, some customers wouldn't understand it at all. But you're almost like if you decided you want to tell the customer about a risk and it's going to cost them money, to go in with a diagram that's got their components and bits they can understand and to show them ... .*

The participant has picked up on a discussion about adding a documentation feature to the technology. They begin by situating their input (*A year ago*) which is then expanded with various details linked with *and*. So, this is a short, coherent narrative which introduces something important to this participant.

Others contribute similarly from their own perspective.

> P1.6: *In the last six months we've had a couple of projects, haven't we? We've had one where basically security testing has been a major part of the project and it's been quite a thorny and protracted affair. If we had something like* [this] *which could lay the groundwork quickly and efficiently that might have been a big help.*

and

P1.8: *But you are talking days at a time. Because if you think how much time we spend, I spend, filling in tender documents on security requirements and so on and if you had something like this, it allows you to construct it a lot quicker.*

Such narratives may not be complete in the traditional sense but instead represent snippets of experience relevant to specific technology-mediated tasks. Users overlook any current shortcomings or gaps in function to imagine how their responsibilities might be addressed through future engagement with the technology.

Subsequently, thematic analysis focused specifically on the transcript for the latter part of the workshop. There are cases where participants identify that the technology (with or without updates) could benefit their work:

P1.2: *Every mitigation that requires action needs to give rise to a developer task that a developer is given and then signs off as tested and it's totally signed off before release. So the mitigations output could be used for that as well and you could I'm sure devise an output that would satisfy both those requirements.*

and

P1.9: *If we can give that person all of the information and then it's clear it helps our argument to get something fixed as well.*

These all relate to *Task applicability* or its relevance for the responsibility of the organisation. Elsewhere, participants identify the potential value of the technology not just for the organisation, but also for themselves:

P1.9: *There's another perspective from our side being system admins. I know it's not to a customer but essentially our managers and our directors are our customers in some regard because they're the ones deciding whether to pay for things.*

and

P1.8: *If you could get... because I'm just thinking I have to do my audits, if I could draw a system, you know, potentially even draw our entire network on it, at least to some approximation.*

Here, there is the *Personalisation* of the potential relevance of the technology. Finally, there appears to be a particular point in the discussion where a participant suddenly realises that there is potential for the technology - again with or without modification - to offer support for many other tasks:

P1.8 *If I had something like that. I don't want something that's pages and pages but, you know, a table of risks versus mitigation actions* [...] *From an audit perspective it would show quite a depth of understanding.*
.

similarly

> P1.2: *Because actually you've got your documentation, you've got it could actually help with the sales pitch and then there's the angle of actually if it stopped us having horrible expensive incidents or even reduced support because we never even had to fix the things, which is intangible. So it's interesting there's three different angles on that. So it would have a value.*

These individual themes represent three superordinate themes summarised in Table 1.

Table 1. Superordinate Themes

Theme	**Description**
Anchoring	a specific connection point between the demonstrated technology and the SME's work, equivalent to an *epiphany* in traditional narratives [42]
Task applicability	the relevance to the narrator's own responsibilities
Personalization	where the narrator sets out increased self-efficacy through adoption of the technology.

These three narrative themes were used as codes to analyse the recordings from *Study 2* as a means of independent validation. Subsequently, they informed the formulation of three seed questions, plus a prompt to encourage further elaboration by the participant, to guide data collection for *Study 3*.

4.2 Study 2: *Technology Validation*

From the sessions, some thirty-four functional and non-functional requirements were identified across nine different areas. To begin with, employees from the four European based SMEs described first their business and business needs without direct experience of the technologies. An initial analysis of these sessions was reported elsewhere [43]. Stability narratives developed, relevant to the current situation at the SME. For instance, in this extract, there are typical markers of narrative progression, such as '*so*' and '*and then*'.

> P2.2: *so we have different ways of working, so err marketing and promotion seminars* [...] *that's the commercial part* [...] *So to demonstrate the different features of the platform... Erm... and so it's indeed going step-by-step usually. So starting with a first pilot project on small cases of business... small buildings* [...]. *And then, once we are running it during a few weeks or a few months so it's err an agreement that we sign and then when it's OK they can do a more larger rollout.*

Narratives here are more discursive since participants were explicitly asked to describe their operations. In the project status meetings, there were cases of specific themes. For example, *anchoring* was evidenced by different participants.

> P3.1: *we found it very easy which was a bit compelling for us, and we couldn't understand whether we were doing the right thing or not.*

and

> P4.1: *we didn't use – as I said –* [TOOL] *before. Now, I think, it's more useful to have five more diagrams* [...] *to cover everything we discovered using the* [TOOL].

So, with some experience of the technologies, participants may also see potential beyond the current requirements and activities. Similarly, they are aware of the *Task applicability* of the technology:

> P2.1: *Company* [NAME] *is particularly interested in understanding situations where trading will become impossible. For example, lack of source information from third parties and attacks against the desktop trading app.*

and later goes on to say:

> P2.1: [TOOL] *will be used ... to understand possible risks in each process and to prioritise the deployment of security controls, avoiding catastrophic downtimes.*

Anchoring led elsewhere to *personalisation* and developing narratives in anticipation of future use with the technologies as seen in the first study from the one-day workshop with the UK SME:

> P1.2: *so* [TOOL] *is becoming part of their* modus operandi.

So, in *Study 2*, there is some evidence that the three superordinate themes in Table 1 are relevant more generally. When reporting to other partners about their experience with the target technologies, they were able to identify potential and to recognise organisational and personal relevance. These were semi-formal sessions, but still participants showed consistent behaviour in response to the target technologies as in *Study 1* in regard to going beyond the simple usefulness and usability of the technology in the specific test environment.

4.3 Study 3: *Protocol Validation*

In this final study, a set of seed questions was developed to elicit small-story narratives constructed around the three superordinate themes identified in *Study 1*. Along with the corresponding theme, the seed questions are shown in Table 2; in each case, a short prompt was added (that is, *Why?* or *How?*) to encourage a

Table 2. Open-ended Questions and the associated Narrative Codes

Narrative Code	**Question**	**Prompt**
Anchoring	*What would these cybersecurity tools mean to your organisation?*	Why?
Task applicability	*Would these tools help you specifically with your own job?*	How?
Personalization	*Would these tools give you a sense that you could manage your use better?*	How?

respondent to elaborate on their answers. To date, three SMEs have responded, one choosing an online meeting (O), the other two answering in writing (W).

To begin with, one of the participants called out a common problem: *communication*. Technologists tend to assume that technical excellence is enough without considering the expectations or aspirations of potential adopters. Interestingly, the participant develops a narrative to describe the frustrations of interacting with technology. See Section 4.3 below.

Communication During the online semi-structured interview, the participant identified a particular problem.

> P5.O *When someone tells me what they have, I don't get that same feeling or this is what could help me or . . . on the other hand, if I see something, and I see it working [. . .] then this could help me. . . The problem with [PROJECT] is. . . I understand what it's about, I've have [created a test environment] . . . it's basically, when we have those Eureka moments . . . and we've had some of those moments already. . . in the first year, maybe, oh and we put together a scenario, but when you put it all together in a scenario, suddenly it didn't make sense for the [technology] partner . . . while for us, we thought we understood. We are doing the same thing in another context, so why doesn't it make sense now?*

In Gergen and Gergen's terminology, this represents a *regressive narrative* [30]. The potential adopter is frustrated in their goals. To begin with, they engage with what the technologists tell them. Next, they create a scenario; but then, the technologists reject it. Later, the participant acknowledges there needs to be a 'common language' for technologists and adopters to communicate effectively. They conclude:

> P5.O*It may be a long stretch – it wasn't part of our scenario – but it made sense. But it was part of the bigger narrative for us.*

This is not an uncommon issue: 'selling' technology is about understanding and meeting user needs, not just technical elegance: *Perceived usefulness* and *Perceived ease of use* in Technology acceptance terms.

Anchoring The three SMEs identify moments where they can see potential beyond the current capabilities of the technology on offer.

> P3.W *Gaining deeper knowledge about the tools and the inferred characteristics of our own internal infrastructure and the software components that we implement allows us to be in control and gives us more options for change management.*

There is even a suggestion that technology may highlight important issues which had not previously been apparent.

> P4.W: *The tools are very good instruments to be aware of threats that we did not foreseen [sic] till now.*

and

> P3.w *These tools enable our company to see some hidden aspects of the cybersecurity domain, allowing us to explore new alternatives/tools to deal with the new security challenges.*

They even acknowledge how such insights develop: *anchoring* is described here as *Eureka moments*.

> P5.O: *So, we had some Eureka moments by talking about it and about thinking about it.*

though the participant admits that some of the Eureka moments *'were duds'*. This suggests they are willing to try new things without an assurance that they will deliver what they expect.

There is some evidence, therefore, for *anchoring*. Potential adopters are therefore open to innovation and going beyond what the technology is used for now.

Task applicability Participants recognise the applicability of the technologies they are trialling. The potential of the technology to meet current and future organisational requirements is easy to see:

> P3.w: *In our daily business, having a full picture of the involved components of our internal infrastructure helps us to integrate new tools and actors seamlessly with the full knowledge of all the incurred risks and vulnerabilities*,

even encouraging improved cybersecurity awareness and behaviours:

> P4.w: *The tools are important to establish a culture of security within the products that we develop. Application security, information security, network security, are all part of what we do nowadays.*

There is even an acknowledgement that the potential adopter can see how the technologies might be part of a bigger picture for the enterprise.

> P5.O *It may be a long stretch – it wasn't part of our scenario – but it made sense. But it was part of the bigger narrative for us*,

providing increased confidence and self-efficacy:

> P5.O *Now that we are further in the project and we understand it more and understand where every partner comes from, we would respond to that remark differently. And we would say: OK, maybe you're wrong, and we could explain it better.*

Potential adopters can see how the technologies can fulfill existing company requirements. More importantly, as evidenced by P5.O, there is also a sense that engaging with the technology irrespective of how it has been positioned for them can lead to feelings of *self-efficacy*. Of course, this relates to trust in technology [37].

Personalisation The final construct is the personal relevance, related to *self-efficacy*, that potential adopters can see with the technology now or in the future.

> P5.O *At the point of the trial, there were too many technical issues. But conceptually, we were on to something that made sense.*

P5.O here recognises technical limitations but is nevertheless more driven by the technology *making sense* and satisfying their own conception of what the technology could allow. Indeed, the partners also recognise that they can work *with* the technology, whilst recognising their goals are limited as far as cybersecurity is concerned.

> P3.w *The tools do not allow us to become security experts but it raises awareness into our internal team about challenges that we didn't* [*sic.*] *face in the past.*

Finally, there is an indication that individual adopters are open to engaging and speculating about innovative ways to exploit the technology.

> P5.O *It would be really useful . . . nice to have in another context, the experience of that so you could make that association and see 'O.K. . . I see how that could work'.*

In seeing potential, partners identify personal relevance for them as individuals. This encourages them to consider what their priorities are and, most importantly, motivates independent innovative speculation.

5 Discussion

We believe these narratives demonstrate a more nuanced approach to technology engagement. Significantly, we suggest, they involve much greater *personal* relevance than user stories or scenario testing. The narrative snippets seen especially in *Study 1* represent the effect of the technology on the professional identity of the participant. The way the technology is perceived becomes a part of the *performance* of that identity [44].

Diffusion of Innovations [17] stresses the contribution beyond attributes of the innovation or technology to consider traits of the potential adopter, the associated communication channels, and the social system or context where the innovation might be used. Similarly, NASSS considers seven different areas, including the technology itself, which need to be addressed to encourage adoption and promote long term sustainability [18]. The concepts of *coherence* and *cognitive participation* in NPT formalise the requirement for stakeholders to recognise potential in the proposed technology not only to solve current issues for them, but to enable a very personal improvement in self-efficacy [19, 45]. What the narratives revealed, and specifically at the *Task applicability* point, is a realisation of potential irrespective of the current state of the technology. Participants began to see what they *might* achieve even though new features would need to be developed and existing shortcomings resolved. They are seeing the potential as it relates specifically to their professional identity [43]. At that point, they begin to create narrative snippets around scenarios important to them professionally and which would become progressive narratives once their imagined version of the technology became available to them.

This very much supports the idea that focusing solely on characteristics of the technology for adoption is not enough. Small-story narratives provide a methodological framework therefore to explore how users perceive not just the technology (as in the Technology Acceptance Model) or subjective norms (as in the Theory of Planned Behaviour), but how potential adopters can make sense of their responsibilities and how they may be benefitted by interaction with the technology. It's worth noting too that adopters will be accommodating towards technical faults and lack of function [35, 36]. Potential adopters are therefore willing to look beyond current performance. If they can engage and understand potential, then they can be creative in the way they approach technology. Technology acceptance is therefore situated within a progressive narrative rather than solely dependent on technology usability or even perceived usefulness.

6 Limitations and Future Work

Cohort size is often a consideration in qualitative research. Whereas quantitative studies rely on power calculations as an estimate of the reliability of results and therefore how generalisable they may be, saturation remains a challenging concept [46]. There is a question, therefore, how generalisable the results reported here might be. Saturation can only really be satisfactorily identified *a posteriori*,

however. Nonetheless, we believe there is sufficient evidence now to inform and motivate further research in this area.

That being said, there are other limitations which should be noted. First, this was very much a research cohort drawn from an opportunity sample: all participants were engaged in collaborative projects with the technology developers. There is a sense, therefore, in which they are motivated to work with and look for ways to identify benefits from those technologies. In other words, there is an incentive for them to react positively to the technology. Future work should consider sampling strategies and how best to ensure generalisability across technology users. Secondly, as far as narratives are concerned, these interactions were not specifically designed to elicit more discursive descriptions of issues or the exploration of how to move forward based on existing technology. In consequence, participants produced narrative 'snippets' rather than more traditional small-story pieces. It would be fruitful to attempt to encourage more reflective use of technology and associated experiences to be able to situate and perhaps provoke innovative thinking around the technologies, that is to encourage *Anchoring*.

Finally, in light of empirical work with adoption frameworks such as NASSS and NPT, it would be worthwhile to consider how encouraging narratives from potential adopters might inform concepts such as *cognitive participation*. By allowing potential adopters to develop their own ideas of how a technology in its current or in a future state might benefit their work, it may be possible to increase the potential for technology adoption.

7 Conclusion

The research reported here is part of a broader concern with the assumption that technology adoption can be predicted solely on the basis of the characteristics of the technology itself. In his original conception of the Technology Acceptance Model of course, Davis did include other constructs which have received less attention than *Perceived ease-of-use* and *Perceived usefulness* [4]. These include *Attitude to use* and *Behavioral intention to use* on the one hand, and *External variables* on the other. It may well be that small-story narratives could influence *Attitude to use* at least in that these narratives may capture potential adopter perceptions that the technology presented would work for them and help them achieve their specific goals.

References

1. Ajzen, I.: The Theory of Planned Behavior. Organizational behavior and human decision processes **50**(2), 179–211 (1991) https://doi.org/10.1016/0749-5978(91)90020-T
2. Montaño, D.E., Kasprzyk, D.: Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In: Glanz, K., Rimer, B.K., Viswanath, K. (eds.) Health Behavior: Theory, Research and Practice. pp. 95–124. Jossey-Bass, San Francisco, CA. (2015)

3. Kautonen, T., van Gelderen, M., Fink M.: Robustness of the Theory of Planned Behavior in Predicting Entrepreneurial Intentions and Actions. Entrepreneurship theory and practice **39**(3), 655–674 (2015) https://doi.org/10.1111/etap.12056
4. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly **13**(3), 319–340 (1989) https://doi.org/10.2307/249008
5. Taherdoost, H.: A review of technology acceptance and adoption models and theories. Procedia Manufacturing **22**, 960–967 (2018) https://doi.org/10.1016/j.promfg.2018.03.137
6. Holden, R.J., Karsh, B-T.: The technology acceptance model: its past and its future in health care. Journal of biomedical informatics **43**(1), 159–172 (2010) https://doi.org/10.1016/j.jbi.2009.07.002
7. King, W.R., He, J.: A meta-analysis of the technology acceptance model. Information & Management **43**(6), 740–755 (2006) https://doi.org/10.1016/j.im.2006.05.003
8. Lewis, J.R.: The System Usability Scale: Past, Present, and Future. Journal of Human–Computer Interaction **34**(7), 577–590 (2018) https://doi.org/10.1080/10447318.2018.1455307
9. Bangor, A. , Kortum, P.T., Miller, J.T.: An Empirical Evaluation of the System Usability Scale. International Journal of Human–Computer Interaction, **24**(6), 574–594 (2008) https://doi.org/10.1080/10447310802205776
10. Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D.: User acceptance of information technology: Toward a unified view. MIS Quarterly **27**(3), 425–478 (2003)
11. Carpenter, C.J.: A meta-analysis of the effectiveness of health belief model variables in predicting behavior. Health communication **25**(8), 661–669 (2010) https://doi.org/10.1080/10410236.2010.521906
12. Norman, P., Boer, H., Seydel, E.R.: Protection Motivation Theory. In: Conner, M., Norman,P. (eds.) Predicting Health Behaviour, pp. 81–126. The Open University Press, Maidenhead, UK (2005)
13. Legris, P., Ingham, J., Collerette, P. Why do people use information technology? A critical review of the technology acceptance model. Information & management **40**(3), 191–204 (2003) https://doi.org/10.1016/S0378-7206(01)00143-4
14. Lucassen, G., Dalpiaz, F., van der Werf, J.M.E., Brinkkemper, S.: The use and effectiveness of user stories in practice. In: Daneva, M., Pastor, O. (eds.) Requirements Engineering: Foundation for Software Quality 2016, LNCS, vol. 9619, pp. 205–222. Springer, Heidelberg (2016) https://doi.org/10.1007/978-3-319-30282-9_14
15. Dieste, O., Juristo, N.: Systematic review and aggregation of empirical studies on elicitation techniques. IEEE Transactions on Software Engineering **37**(2) 283–304 (2011) https://doi.org/10.1109/TSE.2010.33
16. Carroll, J.M. Five Reasons for Scenario-Based Design. In: Proceedings of the 32nd Hawaii International Conference on System Sciences 5th-8th January 1999, (1999). https://doi.org/10.1109/HICSS.1999.772890
17. Rogers, E.: The Diffusion of Innovations. 5th edn. The Free Press, New York, NY. (2003), https://doi.org/10.1109/HICSS.1999.772890
18. Greenhalgh, T., Wherton, J., Papoutsi, C., Lynch, J., Hughes, G., A'Court, C., Hinder, S., Fahy, N., Procter, R., Shaw, S.: Beyond Adoption: A New Framework for Theorizing and Evaluating Nonadoption, Abandonment, and Challenges to the Scale-Up, Spread, and Sustainability of Health and Care Technologies. Journal of medical Internet research, **19**(11), e367 (2017) https://doi.org/10.2196/jmir.8775

19. May, C.R., Mair, F., Finch, T., MacFarlane, A., Dowrick, C., Treweek, S., Rapley, T., Ballini, L., Ong, B.N., Rogers, A., Murray, E., Elwyn, G., Légaré, F., Gunn, J., Montori, V.M.: Development of a theory of implementation and integration: Normalization Process Theory. Implementation Science **4**(1) 29 (2009) https://doi.org/10.1186/1748-5908-4-29
20. Pickering, B., Nouri Janian, M., López-Moreno, B., Michiletti, A., Sanno,A., Surridge, M. : Seeing Potential is more important than usability: Revisiting technology acceptance. In: Marcus A., Wang W. (eds.) Design, User Experience, and Usability. Practice and Case Studies. HCII 2019. Lecture Notes in Computer Science, vol 11586. Springer, Cham. (2019) https://doi.org/10.1007/978-3-030-23535-2_18
21. Pickering, B., Bartholomew, R., Nouri Janian, M., López-Moreno, B., Surridge, M. : Ask Me No Questions: Increasing Empirical Evidence for a Qualitative Approach to Technology Acceptance. In: Kurosu M. (eds.) Human-Computer Interaction. Design and User Experience. HCII 2020. Lecture Notes in Computer Science, vol 12181. Springer, Cham.(2020) https://doi.org/10.1007/978-3-030-49059-1_9
22. Orne, M.T.: On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. American Psychologist **17** 776–783 (1962)
23. Ponto, J.: Understanding and evaluating survey research. Journal of the advanced practitioner in oncology **6**(2) 168–171 (2015)
24. Brown, A.: The place of ethnographic methods in information systems research. International Journal of Multiple Research Approaches **8**(2) 166—178 (2014) https://doi.org/10.1080/18340806.2014.11082058
25. Pope, C., Halford, Turnbull, S.J., Prichard,J., Calestani, M., May, C.: Using computer decision support systems in NHS emergency and urgent care: ethnographic study using normalisation process theory. BMC Health Services Research **Vol. 13** 111 (2013) https://doi.org/10.1186/1472-6963-13-111
26. Nguyen, L., Torlina, L., Peszynski, K., Corbitt, B.: Power relations in virtual communities: An ethnographic study. Electron Commerce Res 6, 21–37 (2006). https://doi.org/10.1007/s10660-006-5986-9
27. Harrington, B.: The Social Psychology of Access in Ethnographic Research. Journal of Contemporary Ethnography **32**(5) 592–625 (2003) https://doi.org/10.1177/0891241603255677
28. McDonald, S., Edwards, H.M., Zhao, T.: Exploring Think-Alouds in Usability Testing: An International Survey. IEEE Transactions on Professional Communication **55**(1) 2–19 (2012) https://doi.org/10.1109/TPC.2011.2182569
29. Murray, M. Narrative Psychology. In: Smith, J.A. Qualitative Psychology:A Practical Guide to Research Methods. SAGE Publications Ltd., London, UK. 85–107 (2015)
30. Gergen, K.J., Gergen, M.M.: Narrative form and the construction of psychological science. In: Sarbin, T. (ed.) Narrative Psychology: the Storied Nature of Human Conduct. Praeger, New York. 22–44.
31. Murray, M. Narrative psychology and narrative analysis. In: Camic, P.M., Rhodes, J.E., Yardley, L. (eds.) Qualitative Research in Psychology: Expanding perspectives in methodology and design. American Psychological Association: Washington, DC. 95–112 (2003)
32. Stokoe, E., Edwards, D. Story formulations in talk-in-interaction. Narrative Inquiry **16**(1) 56–65 (2006) https://doi.org/10.1075/ni.16.1.09sto
33. Bamberg, M., Georgakopoulou, A.: Small stories as a new perspective in narrative and identity analysis. Text & Talk-An Interdisciplinary Journal of Language, Discourse Communication Studies, **28**: 377–396. (2008)

34. Pozzi, G., Pigni, F., Vitari, C.: Affordance Theory in the IS Discipline: a Review and Synthesis of the Literature. AMCIS 2014 Proceedings, 2014, Savannah, United States. https://halshs.archives-ouvertes.fr/halshs-01923663/document
35. Lee, L.D., Moray, N.: Trust, control strategies and allocation of function in human-machine systems. Ergonomics **35**(10) 1243–1270 (1992) https://doi.org/10.1080/00140139208967392
36. Lee, J.D., See, K.A.: Trust in automation: Designing for appropriate reliance. Human Factors: The Journal of the Human Factors and Ergonomics Society **46**(1) 50–80 (2004) https://doi.org/10.1518/hfes.46.1.50_30392
37. Thatcher, J.B., Zimmer, J.C., Gundlach, M.J., McKnight, D.H.: Internal and external dimensions of computer self-efficacy: An empirical examination. IEEE Transactions on Engineering Management, **55** (4) 628–644 (2008) https://doi.org/10.1109/TEM.2008.927825
38. Surridge, M., Meacham, K., Papay, J., Phillips, S.C., Pickering, J.B., Shaffiee, A., Wilkinson, T.: Modelling Compliance Threats and Security Analysis of Cross Border Health Data Exchange. In: Attiogbé C., Ferrarotti F., Maabout S. (eds.) New Trends in Model and Data Engineering. MEDI 2019. Communications in Computer and Information Science, vol 1085. Springer, Cham. (2019) https://doi.org/10.1007/978-3-030-32213-7_14
39. Boletsis, C., Halvorsrud, R., Pickering, J., Phillips, S., Surridge, M. (2021). Cybersecurity for SMEs: Introducing the Human Element into Socio-technical Cybersecurity Risk Assessment. In: Hurter, C., Purchase, H., Braz, J., Bouatouch, K. (eds.) Proceedings of the 16th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - IVAPP, pp. 266–274. (2021) https://doi.org/10.5220/0010332902660274
40. Braun, V., Clarke, V.: Using thematic analysis in psychology. Qualitative research in psychology **3**(2) 77–101 (2006) https://doi.org/10.1191/1478088706qp063oa
41. Alhojailan, M.I.: Thematic analysis: A critical review of its process and evaluation. West east journal of social sciences **1**(1) 39–47 (2012)
42. Murray, M.: Levels of narrative analysis in health psychology. Journal of health psychology, **5**(3), 337–347 (2000)
43. Pickering, B., Boletsis, C., Halvorsrud, R., Phillips, S., Surridge, M.: It's Not My Problem: How Healthcare Models Relate to SME Cybersecurity Awareness. HCI International 2021: 23rd International Conference on Human-Computer Interaction Washington DC, USA 2021. Springer LNCS 12788 https://doi.org/10.1007/978-3-030-77392-2_22
44. Bauman, R.: Language, identity, performance. Pragmatics, **10** 1–6 (2000)
45. May, C.R., Finch, T.: Implementing, embedding, and integrating practices: An outline of normalization process theory. Sociology **43**(3) 535–554 (2009) https://doi.org/10.1177/0038038509103208
46. O'Reilly, M., Parker, N.: 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. Qualitative Research **13**(2) 190–197 (2013) https://doi.org/10.1177/1468794112446106