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Exploring the impacts of generative AI on artistic innovation routines

Wenyi Chu, David Baxter *, Yang Liu

Southampton Business School, University of Southampton, UK

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ABSTRACT

Generative AI (GenAI) is now being used in many computer-based knowledge works by various human–AI collaborations, as a major recent technological shift. However, micro-level research of GenAI impacts is rare. Moreover, whilst the creative industries are early adopters and heavy users of GenAI, there is a lack of research in this domain. To bridge these gaps, this study implemented an inductive approach to evaluate the application of GenAI in artistic innovation based on a detailed case study in a show production firm making use of company documents, interviews, and observations. The theoretical lens of routine dynamics reveals the nature of the impacts. As both a working tool and a communication facilitator, the collective application of GenAI as the working medium led to the ostensive sequence change of routines as simultaneous exploration of problems and solutions for creativity and innovation. We provide two main theoretical implications. First, individual and collective application of GenAI as both digital working tool and medium in artistic creation can improve productivity of creation and iteration. Second, such human-AI collaboration results in the routine adaptation of ostensive aspect by changing the path and interface of routine clusters and mixtures the sequential routines within creation with local events rather than systematically transforming routines.

1. Introduction

Humans can collaborate with AI to enhance organizational productivity (Mariani et al., 2023; Plastino and Purdy, 2018; Raisch and Fomina, 2024) as it can aggregate knowledge, process information, search for solutions, and make predictions (Agrawal et al., 2017; Csaszar and Steinberger, 2022; Verma and Singh, 2022). GenAI is a type of AI that can create new content (Ramaul et al., 2024; Wahid et al., 2023) such as text, images, music, video, software code, and others. It has the potential to be applied in nearly every workplace (Ritala et al., 2024) and its application has spurred increasing academic interest (Cordasco et al., 2021; Singh et al., 2024). However, two problematic gaps exist in the extant literature.

First, many management studies of GenAI applications are based on education, hospitality, finance, and professional services (Berg et al., 2023; Dwivedi et al., 2023). However, creative industries are often heavy users and early adopters of emerging technology including AI (Landoni et al., 2020). For example, GenAI tools have been applied to creative ideations (Chen et al., 2019). In addition, creative industries are a considerable economic sector, larger than the telecoms or automotive sectors in many economies (OECD, 2021), and have a significant impact on the innovation and dynamism of a region (Boix et al., 2016; Burlina et al., 2023). Hence, the scant research into GenAI applications in the creative industries is an important gap.

Second, extant literature mainly discuss the impacts of GenAI applications as aggregate outcomes or academic predictions. For example, AI is an emerging technological artifact with profound influences on task execution (Iansiti and Lakhani, 2020), decision making (Glaser et al., 2021; Lindebaum et al., 2020), and worker activities (Kellogg et al., 2020). GenAI adoption can improve human efficiency, aid product development, and enhance organizational performance (Rana et al., 2024). Since the impacts of human–AI collaboration are contingent (Raisch and Fomina, 2024), the lack of micro-level research could be problematic.

The two gaps can be bridged by exploring the impact of GenAI on the routine of artistic creation. Creative industries produce artistic innovation (Castañer and Campos, 2002; Stoneman, 2009) as projects (Bizzi and Miller, 2022; Clegg and Burdon, 2021). Such novelty is generated by routines of complex and flexible group iterations with diverse actors participating interdependently (Bechky, 2006; DeFillippi, 2015; Hatcher et al., 2018; Paris & Ben Mahmoud-Jouini, 2019). The innovation process in the creative industries has been summarized by Paris and Ben

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* Corresponding author.
E-mail addresses: wc1n20@soton.ac.uk (W. Chu), d.baxter@soton.ac.uk (D. Baxter).

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Mahmoud-Jouini (2019) as four iterative activities of inspiration, framing, prototyping, and validation. The routine dynamics approach, which stresses the importance of situated routine actions (Feldman and Pentland, 2003; Feldman et al., 2016, 2021), could be adopted to study the micro-level impact of GenAI on the creative industries.

Hence, this study is led by the research question: *How does GenAI impact artistic creation routines?*

A single in-depth case study was conducted to address the research question. The case firm, a Chinese show production corporation, hereafter referred to as TF (pseudonym name), started a firm-wide application of GenAI in March of 2023. Performing arts, as with other creative businesses, is competing with creativity and radical innovation (Bergamini et al., 2018; Gray and Heilbrun, 2001). The Chinese performing arts business is a considerable market by global comparison. England's theaters reported a total earned income of GBP303 million in the 2022/23 fiscal year (Statista, 2023a). For Broadway shows in New York, the total attendance reached 12.3 million in 2022/2023, contributing gross sales of USD1.6 billion (Statista, 2023b). According to data collected by the China Association of Performing Arts, the whole sector had a total attendance of over 170 million in 2023 with a turnover of RMB 74 billion, roughly USD10billion, including 11% from box-office takings of theater plays, 27% from box-office takings of commercial events such as concerts, and 22% from box-office takings of tourism plays (Paper, 2024).

This paper makes empirical contributions of elaborating GenAI, as both a working tool and a communication facilitator. The collective application of GenAI as the working medium led to the ostensive sequence change of routines as simultaneous exploration of problems and solutions for creativity and innovation. We provide two main theoretical implications. First, individual and collective application of GenAI as both digital working tool and medium in artistic creation can improve productivity of creation and iteration. Second, such human-AI collaboration results in the routine adaptation of ostensive aspect by changing the path and interface of routine clusters and mixtures the sequential routines within creation with local events rather than systematically transforming routines.

The rest of the paper is structured as follows. The next section reviews the extant literature on artistic innovation from the perspective of routine dynamics and discusses AI as a new artifact for creative routines. The methodology section follows the literature review. The section thereafter presents the findings and analysis. The final section, the discussion, includes subsections on theoretical implications, practical implications, limitations and future research, and a conclusion.

2. Theoretical background

2.1. Artistic creation

Artistic creation requires both creativity and innovation (Berg, 2022; Bharadwaj et al., 2017; Khaire and Hall, 2016; Lehtonen et al., 2020; Slavich et al., 2020). A diverse range of actors with varied skills (DeFillippi, 2015) must collaborate in an interdependent way to create artistic innovation. For example, Uzzi and Spiro (2005) studied Broadway shows and concluded that show production relies on collective brainstorming, idea sharing, and joint problem solving. Several representative processes of creativity and innovation are summarized in Table 1.

Previous studies of Hollywood productions also highlight the importance of group work (Cattani and Ferriani, 2008) in the creative process. Creativity as the output of group cognition demands collaborative divergence as ideas and constraints co-evolve (Hatcher et al., 2018). Group interactions in the creative process are therefore recursive loops of reflections producing collective energy, attention, and understanding that transform individual inputs into creative outcomes (Harvey et al., 2023; Harvey, 2014). These iterations can be conceptualised as a snake-shape progression (Paris & Ben Mahmoud-Jouini, 2019), frequent revision loops with testing (Goh and Pentland, 2019), continuous revisions and contextual repositioning (Håkonsen Coldevin et al., 2019), or rounds of ongoing experimenting, evaluation, and legitimating (Clegg and Burdon, 2021).

Table 1
Phases and processes of creation.

Literature	Routine phases	Process and practice
Gohoungodji and Amara (2022)	Creativity	Idea generation
	Innovation	Idea exploitation
Anderson et al. (2014)	Creativity	Idea generation
	Innovation	Idea implementation
Amabile and Pratt (2016)	Creativity	Task presentation Preparation Idea generation Idea validation Outcome assessment
	Innovation	Agenda setting Stage setting Idea production Ideas testing Idea implementing Outcome assessment
Perry-Smith and Mannucci (2017)	Creativity	Idea generation Idea elaboration Idea champion Idea implementation
Paris and Ben Mahmoud-Jouini (2019)	Creativity	Inspiration Framing Prototyping Validation
Mumford and Todd (2020)	Creativity	Defining the problem Gathering information Selecting and combining concepts Idea generating Idea evaluation Planning Implementation Adaptive monitoring

2.2. Routine dynamics

Routines are the way by which organizational work gets done, as recognizable and interdependent actions and interactions in logical sequences (Pentland et al., 2012) by multiple actors, artifacts, and agencies (D'Adderio, 2011; Feldman and Pentland, 2003; Orlikowski and Scott, 2008). Organizational routines can provide a sense of order and efficiency (Aroles and McLean, 2016). Routines have both ostensive and performative aspects. The ostensive pattern (Feldman et al., 2021) defines generalized and abstract principles of a routine. The performative pattern is the situated performance of routines as specific actions by specific actors situated in particular places and times (Feldman and Pentland, 2003). Rather than mindless or straightforward repetition (Deken et al., 2016), actors must engage in effortful accomplishments for routine performance (Feldman et al., 2021). Hence, routines performance are subject to the behaviors of particular actors and their contexts (Deken et al., 2016). *Routine dynamics* is the study of routine change, including repairing, expanding, and striving, that result in change over time (Feldman, 2000; Feldman and Pentland, 2003). *Routine clusters* are groups of multiple interdependent and coordinated routines, each contributing partially to the accomplishment of a collective output (Kremser et al., 2019; Kremser and Schreyögg, 2016). The performative variation of routine clusters may also arise from both effortful and emergent accomplishments of single routines (Kremser et al., 2019). Cluster flexibility could also come from the changing

interactions of interdependence and coordination among various routines (Sailer et al., 2024).

Reflecting on artistic innovation, the phases and processes in Table 1 represent ostensive principles that could guide creative organizations to coordinate their activities (Bapuji et al., 2019). Moreover, the interdependent collaboration for creativity (Harvey, 2014; Uzzi and Spiro, 2005) indicates that artistic innovation relies on routine clusters, and that the cluster variations could be more profound due to the recursive and iterative characteristics of artistic innovation (Håkonsen Coldevin et al., 2019).

2.3. GenAI as a technological artifact in organizational routines

Routines are not only abstract relations as shared understandings and rules (Feldman, 2004), representing ostensive guidance on what to do (Murray et al., 2021), but are also generative (Howard-Grenville and Rerup, 2017) and dynamic. Artifacts play an instrumental role (Cohen et al., 1996), impacting the emergence and persistence of routines by supporting or preventing actions and coordination (D'Adderio, 2011). Complex socio-material assemblages between actors and artifacts drive varied forms of routine performance (D'Adderio and Pollock, 2020), creating heterogenous organizational outcomes for the execution of routines (Aroles and McLean, 2016). Technological artifacts are critical for routine execution and change with local discretion and adaptation by actors (Berente et al., 2016). Routines may contain intrinsic flexibility to adapt to emerging technologies (Murray et al., 2021). Adding new digital artifacts may generated new paths(Pentland et al., 2020a,b). Applications of technology artifacts could be modified by individual actors with personalization, customization, and inventions for flexibility, adaptivity, and exaptability, respectively (Desouza et al., 2007). The ostensive aspect of routines can be changed by technology artifacts. Pentland et al. (2020a,b) established a simulation model for process change and routine dynamics in the digital environment that unanticipated bursts of complexity followed by relative inertia and the system settled into a new regime after self-organizing.

As a novel artifact, AI tools may improve productivity. GenAI can complete repetitive tasks, enhancing the efficiency and effectiveness of organizational process (Ooi et al., 2024). The innovation process involves intensive creative activities of discovering, generating, developing, and exploiting various ideas, opportunities, and solutions (Kijkuit & Van Den Ende, 2007; Martin and Wilson, 2016). As humans are constrained by mental capacity and knowledge scope that limits their innovation search within particular domains (Posen et al., 2018), AI entails superior information-processing capabilities and non-local searching scope that can promote organizational problem solving and reduce innovation cost and risk (Haefner et al., 2021). By exploring unconventional pathways for problem solving and supporting decision making (Peres et al., 2023), GenAI can generate distinct impacts on creativity and innovation (Singh et al., 2024).

The creative industries are good at integrating new technologies (Wijngaarden et al., 2019). Digitalization has been adopted to enhance audience experience (Alshawaaf and Lee, 2021). Music companies responded to digital platforms such as iTunes and Spotify by gradually replacing physical CDs and re-inventing solutions or developing new solutions for innovative music offerings (Trabucchi et al., 2017). Technology advancement has also led the evolution of the gaming industry (Ozalp et al., 2023). Hence, there is potential for GenAI, as a new technological artifact, to be absorbed (Berente et al., 2016) into routines of artistic innovation. However, both GenAI application in organizational practice and novel digital tool applications in the literature of creative industries are rarely discussed in terms of the process activities, or the routine variations. Such omission is problematic as new technological artifacts could have a profound impact on organizational routines. For example, digital technology-induced information overload impacts the practices and behaviors of creative actors (Lingo, 2023). Likewise, digital platforms can replace the need for physical co-location in the creation process (Schiemer et al., 2023). In addition, since artistic creation routines appear to be routine clusters with interwoven and interdependent routines (Sailer et al., 2024), local adoptions of GenAI may have widespread effects beyond any single routine. With little previous research investigating this phenomenon, this empirical investigation seeks to explore the impact of GenAI on artistic creation routines.

3. Methodology

3.1. Research strategy and design

To understand how the utilization of GenAI impacts artistic creation routines, an in-depth qualitative method was adopted in order to develop a deep understanding of the contextual human experience (Myers, 2020; Silverman, 2021) within one case firm (TF) (Yin, 2018), as a micro-level study of routine dynamics. In this phenomenon-based study (Graebner et al., 2023), we implemented inductive (Blaikie and Priest, 2019; Gioia et al., 2013) inquiry to explore theoretical explanations of emerging practices (Goffin et al., 2019). A single case can be sufficiently convincing for theory development when the object is extraordinary (Eisenhardt, 1989; Siggelkow, 2007). To implement the research, a number of data collection methods were employed including documents provided by the case firm, primary data collection including non-participant (Eriksson and Kovalainen, 2016; Felin and Foss, 2023) and shadow (Karunakaran, 2022) observations to gain knowledge from real-time events, and semi-structured interviews (Myers, 2020). Table 2 provides an overview of the research strategy.

3.2. Case background and data collection

The case firm, TF, a top Chinese show production corporation, has over 300 in-house professionals aiming to produce impressive shows with creative concepts and interdisciplinary innovations. The first author studied this firm as her PhD project. During the observation of a management meeting in March of 2023, TF announced the firm-level decision to use GenAI. This was following the use of GenAI applications by some of TF's designers, which showed convincing benefits. The data collection is summarized in with accompanying explanations.

Secondary data sources, as shown in Table 3, were reviewed including archived documents relating to several past projects, the last four years' company annual reports, and the archived management meeting memos from the past two years. To acquire peripheral

Table 2
Data collected and contribution.

Data collected	Count	Contribution
Secondary files (March 2023)	264	Understand show production routines in depth.
Non-participant management meeting observation (March–November 2023)	14	Understand what is happening, in real-time, with the iterative and recursive dynamics within creativity and innovation.
Phase I interviews (March–July 2023)	11	Understand show production routines in depth and early experience of GenAI utilization.
On-site interview (October 2023)	1	Understand GenAI as digital change and its impact on overall artistic creation routine as a whole from the participant's view.
On-site desk work shadow observation (October 2023)	3	Understand GenAI utilization.
On-site rehearsal shadow observation (October 2023)	1	Understand show production routines' recursive iteration in depth.
Phase II interviews (November 2023)	22	Understand the GenAI utilization for creativity and innovation; in-depth details of GenAI use.

Table 3
Detailed breakdown of secondary data sources.

Source type	Data	Files in total	File pages	Files upload to NVivo
Secondary	Historical project materials	207		13
	Media coverage of the firm	28		0
	Annual report	4	734	4
	Historical management meeting memo	24	319	24
	Firm structure	1	2	0
Total		264		41

knowledge of production, we also read media coverage about the firm, the shows that they produced, and media interviews with their producers, directors, and designers.

Next, from March 2023 to July 2023, the first author carried out the first phase one-to-one semi-structured interviews through virtual conference calls to understand the show production process, as shown in Table 4. In this stage, she engaged 10 participants (nine males, one female; professional experience ranged from seven to 28 years), the board, and management to middle-level managers, including producers, directors, and designers from different types and size of shows produced by the firm. Through these interviews, she also confirmed the wide application of different types of GenAI in multiple functions. In addition, the researcher also independently sourced an external expert (male with professional experience of around 20 years, who has worked as chief director of technicians on many shows in another major show firm.

In October 2023, the first author conducted on-site data collection, as shown in Table 5. She visited TF's office to observe the work of three professionals (two males, one female; professional experience ranged from 6 to 14 years) in order to understand the use of GenAI in their work. At the office, she had some causal chats with the head of Human Resources and other colleagues from supporting departments as well to learn more about the firm and business. In addition, she traveled to one of TF's in-production shows to conduct a face-to-face interview with the chief producer (professional experience of around 30 years) regarding the use of GenAI in that show. To triangulate the core creators' work, she independently sourced another show in-production, other than the work of TF. She shadowed the director team (three males, two females; professional experience ranged from 4 to 22 years) of this show for their on-site rehearsal. During the process of shadowing, she also had many extra chats with colleagues from multiple functions in their on-site production team, especially technicians, to better understand the show production context.

With accumulated knowledge and a refined interview protocol to address GenAI, the first author conducted a second phase of one-to-one online interviews in November 2023. This phase included a purposive sample of 22 participants (14 males, 7 females; professional experience ranged from 5 to 31 years)— i.e., intense users of GenAI in their day job, including senior and middle-level managers, and designers. The data sources are summarized in Table 6.

For the entire primary data collection from March to November 2023, through a virtual conference system, the first author observed 14 real-time management meetings with codes allocated for each meeting in Table 7. The management meeting is a critical and strategic occasion for the firm, participated in by executives and managers, and the heads of each producing functions. Thus, not only are managerial issues addressed but the significant show projects during production are also discussed.

3.3. Data analysis

Interviews and management meeting observations were audio-recorded and fully transcribed in Chinese, the original language, no later than two days after the interviewing and observing.

To execute systematic coding, 93 files including reports, transcripts, notes, and memos were uploaded into NVivo. To avoid missing important information and to reduce the potential for translation errors, we started coding from Chinese data, following the Gioia method (Gioia et al., 2013). The coding structure and representative quotes were then translated into English. The final coding structure is presented in Fig. 1.

In October 2024, we got back to TF to discuss the key findings in-person with key creators and senior management, including KI.4, SK.1, OC.1 and CII.5 etc. We received positive feedback confirming our results and the participants agreed with our analytic distinguishment of creativity routine and innovation as they acknowledged each have interrelated but relative independent problems and solutions. Also, the participants agree with our conclusion that with GenAI, both creativity and innovation problems and solutions could be searched and discussed during one meeting now, which had been in strict sequence as set steps without mixture previously without GenAI.

4. Findings and analysis

4.1. Artistic creation routines in TF, GenAI impact

The study revealed a detailed description of the artistic creation process in TF, and this is outlined in Fig. 2. The organizational units, artistic creation phases, and the decision-making authority are all indicated. The diagram also indicates the phases in which GenAI is applied (planning, designing, and prototyping).

Each show production is a complex group collaboration with a two-level structure. The upper level is the decision group, leading throughout all phases. Key creators include the chief director, the chief producer, the chief designer, and the chief technicians. The lower-level implementation groups are creative and innovative, each composed of several diverse functions and teams. The director team leads creative functions, such as music team, and dynamic visual team. The producer team leads the innovation functions, such as set design team and technician team. The artistic creation phases include creation planning, designing, prototyping, production, and rehearsal. Consistent with the literature, we found abundant recursive iterations in the creative process.

Creation planning, as the first phase, develops the performance goals of a show against the show's investment budget, investors' expectations, location culture, and history. The phase is concluded when the conceptual development has achieved a general set of creative insights, as exemplified by KI.2*:*

> *In those early meetings, we would not discuss how to create or do artistic innovation, but all the key creators have discussed inspiration thoroughly to shape what theme we want to express.*

Table 4
Primary data sources: Phase I interviews.

Source type	Data	Participants' function and code name	Minutes in total	Transcript pages (font 11, single space)	Files uploaded to NVivo
Primary interview	Phase I interview	Key creators: KI.1, KI.2, KI.3, KI.4	297	43	4
	Phase I interview	Creativity group: CI.1, CI.2	170	21	2
	Phase I interview	Innovation group: NI.1, NI.2, NI.3, NI.4	197	51	4
	Phase I interview	Industry technician expert: EI.1	84	14	1
Total		11			11

Table 5
Primary data sources: On-site observation and interviews.

Source type	Data	Participants' function and code name	Minutes/ days	Transcript pages (font 11, single space)	Files uploaded to NVivo
Primary- on-site observation and interviews	Desk work shadow observation	In-house director: SK.1	280	2	1
	Desk work shadow observation	Creativity group: SC.1	240	2	1
	Desk work shadow observation	Innovation group: SN.1	140	3	1
	Rehearsal shadow observation	Top director team: EII.1, EII.2, EII.3, EII.4, EII.5	2-day	5	1
	On-site face-to-face interview	In-house producer: OC.1	80	7	1
Total		9			5

Table 6
Primary data sources: Phase II interviews.

Source type	Data	Participants' function and code name	Minutes in total	Transcript pages (font 11, single space)	Files uploaded to NVivo
Primary interviews	Phase II interviews	Key creators: KII.1, KII.2	104	13	2
	Phase II interviews	Creativity group: CII.1, CII.2, CII.3. CII.4, CII.5, CII.6, CII.7	282	41	7
	Phase II interviews	Innovation group: NII.1, NII.2, NII.3, NII.4, NII.5, NII.6, NII.7, NII.8, NII.9, NII.10, NII.11, NII.12, NII.13	529	68	13
Total		22			22

Table 7
Primary data sources: Non-participant observation.

Source type	Data	Meeting counts and code name	Minutes in total	Transcript pages (font 11, single space)	Files uploaded to NVivo
Primary- non-participant observation	Management meeting observation	14 meetings: OB.1, OB.2, OB.3, OB.4, OB.5, OB.6, OB.7, OB.8, OB.9, OB.10, OB.11, OB.12, OB.13, OB.14	2338	335	14

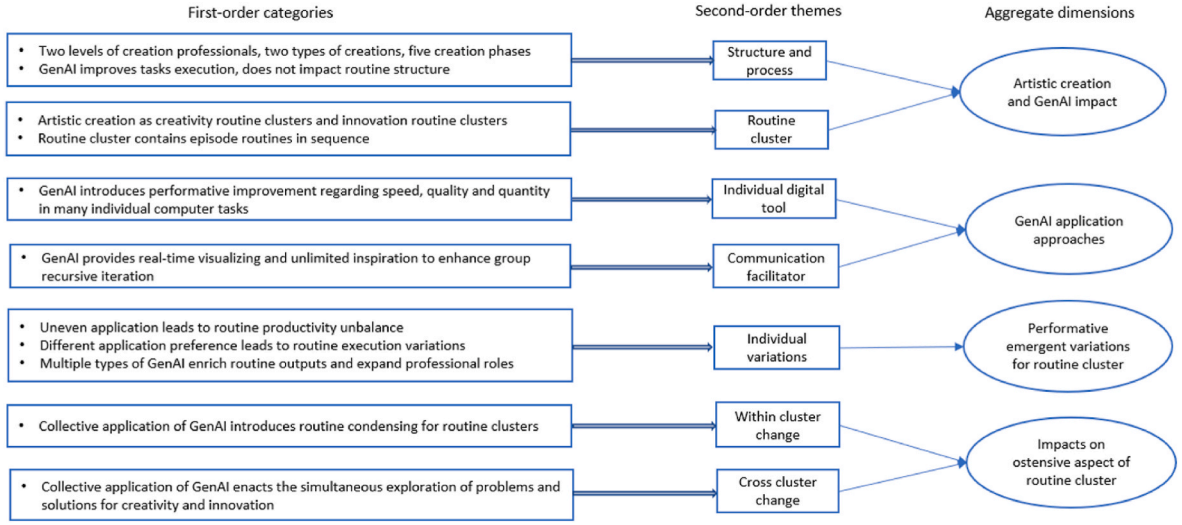

Fig. 1. Coding structure.

Design is executed for a significant period with interactive and iterative activities to construct, interpret, and visualize the abstract concept of the entire show. It is a key creation period of continuously searching a wide variety of creative concepts, developing various concepts into visual images for comparison and evaluation, then deciding workable concepts and abstract interpretations to move on to prototyping or developing additional concepts to go over again. By the end of this phase, the stories to be performed and the major technological means are temporarily shaped for prototyping. One executive director reported in a management meeting on the design progress of one show:

> *The [design] is led by the chief director, the scriptwriter, and the key designers. Their work outputs, including versions reflecting original thinking and improvements, are prepared by stage art and dynamic visual*

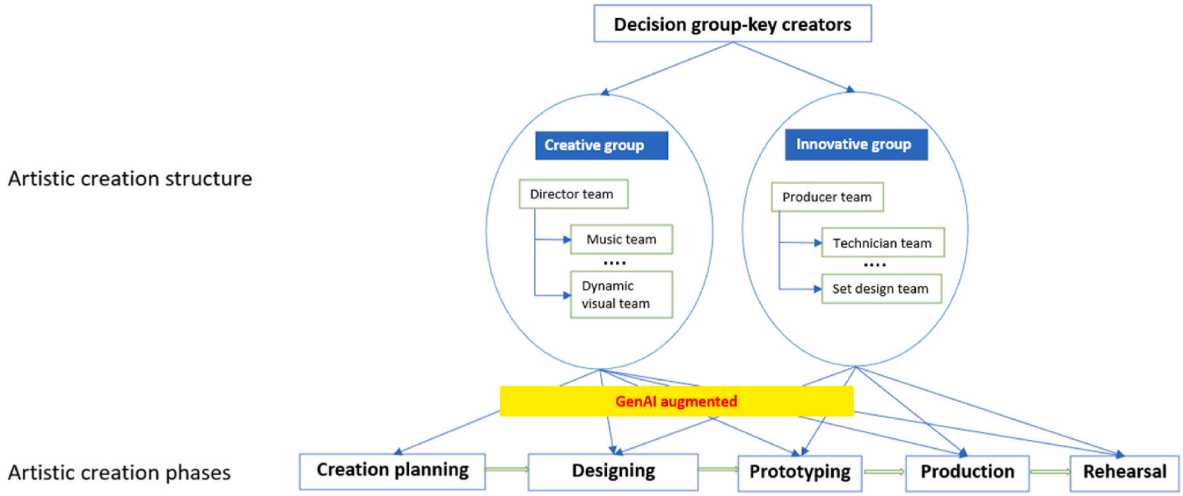

Fig. 2. Artistic creation routines in TF.

teams as in the report. The technician team will receive instruction for their screening of feasible technology schemes shortly (OB.11).

Next, prototyping includes both computer-based desk prototyping and on-site experimentation as physical prototyping. The prototyping routine includes many integrated efforts that involve designers carrying laptops to work on-site with technicians to discuss, iterate, and build the physical artifacts. The interview participant of NI.3 shared the experience of an interactive show G, located in the lobby of the top floors of a skyscraper, which was an unprecedented creation with a significant period of iteration between computer programming and physical prototyping:

The space has a 360-degree viewing … over two months, after seven versions of schemes to finish the prototyping … There is interdependent coordination from physical data collection transiting to the computer for programming, then from computer output of music and lights to physical medium … demands a high quality of the device harmonizing and program debugging … there is no room for any error.

The production, similar to prototyping, includes both computer-based and physical production. Physical production includes the materialization of, among others, stage, scene, and props. There are also various computer-based productions including dynamic visual content that will be played on various media such as air, wall, and stage floor. A dynamic visual manager explained desk production in the interview:

For us, the production is on our computer where we finalize the static image in one set of software and change into another set of software to make them dynamic. Then finally we made the complete streaming episodes for the show; this is our production. (CI.2)

Finally, rehearsal includes both performer rehearsal and technological rehearsal. Performing is relatively independent, and so is not discussed in this paper, but technological rehearsal is closely connected with previous routines. Along with the on-site performing, the key creators will observe, evaluate, and raise demands for adjustment and may require change for design, prototyping, and production.

Reflecting on the creation process we investigated that after the general artistic direction pointed as the guidance for both routines of creativity and innovation, the follow-on processes are better viewed as addressing problems with solutions designed, experimented and validated respectively, less likely to be idea generation and implementation. Hence, borrowing the commonly adopted phases splitting of creativity and innovation in literature of Table 1 and problem-solving processes from Table 1 of relevant activities for our setting, we analytically and conceptually unpacked creativity and innovation cluster routines into routine episodes (Deken et al., 2016) in Table 8.

Considering artistic innovation as episodes of problem-solving activities, we analyze it as below:

Creative problem searching and problem framing was recalled by interview participant CI.1 about their experience as the vice director of Project X*:*

Once the theme decided, we started to work on the content and structure by teams of script writers and visual designers with numerous designing drafts … The overall aesthetic of the stage is on our responsibility.

They also shared tasks of creativity solution searching, solution desk iteration, and finalizing:

Once we have determined the story, the dynamic visual function split their people into 2D, 3D, and dynamic streaming teams.

Interview participant NI.1 shared his experience as executive producer of Project Y. We consider their experience as innovation solution searching, solution desk quantifying, and validating:

The technical functions of the show include stage, mechanics and wire work … for each possible solution, we are not just brainstorming and analyzing feasibility, we have to search market information and do real calculation to check the respective initial investment cost and long-term maintenance expense before we proceed …

Creativity represents the whole concept generation for the show, but also develops some final artifacts including music and dynamic visuals. The innovation group creates and delivers the physical creation including stage, set, and scenes for the show. Creativity and innovation professionals work together to formulate and resolve problems and solutions, with consideration of each other's expertise. Hence, we can understand these artistic routines as clusters (Kremser and Schreyögg,

Table 8
Artistic creation routine activities.

	Creativity cluster routines	Innovation cluster routines
Episode routines in sequence	General problem defining	
	Problem searching	Problem searching
	Problem framing	Problem framing
	Solution searching	Solution searching
	Solution desk iteration	Solution desk quantifying and validating
	Solution desk finalizing	Solution physical experimentation
		Solution physical finalizing

2016) of creativity and innovation, as shown in Fig. 3.

Rehearsal has an independent routine of performing, in addition to creativity and innovation routines. This paper does not discuss performing as the focus is GenAI application, which did not occur in performing in our case. However, during rehearsal, the re-equipment of modification and adjustment by redesigning and reproduction of creativity and innovation may emerge. In the circumstances, the respective creativity and innovation routines will be implemented as usual, as they are part of the rehearsal, but not the performing. Thus, there are two dash lines connecting phase rehearsal with cluster routines of creativity and innovation.

4.2. GenAI application approaches

4.2.1. GenAI as a digital tool improves individual productivity

In March 2023, TF announced that GenAI can be used widely in the artistic creation process as *"GenAI can write rhythm, it can make design pictures very quickly with acceptable usefulness"* (OB.2). Smaller scale trials had already taken place, and a number of useful applications for GenAI had already been seen to help professionals in various tasks. "*For art design, GenAI may provide ideas of whole ambiance. For lighting design, GenAI can give suggestions of lights setting and lighting design. Even the equipment structure and design, AI*[1] *can also generate inspirations"* (OB.2). GenAI was later used in a wide variety of tasks including creation planning, designing, and desk prototyping for individual performance enhancement including productivity. Set designers mainly use image GenAI for conceptual inspiration and 2D visualizations of the stage. Dynamic visual designers use GenAI for visual concept designs and desk prototyping. The director team uses GenAI in developing ideas for the initial theme of the show.

There were a number of positive comments from the interview participants about the value of GenAI in artistic creation. As one executive producer reported:

> *GenAI improves productivity by around 50% for the desk-relevant tasks in show production, which includes greater efficiency in early stages of production, including creative concepts, set design, dynamic visual design, some desk prototyping, and iterative adjustments of redesigning. They are speeding up task handling and submission incredibly, from days or weeks to hours … from a complete show production perspective, 50% is a moderate estimation of benefits from GenAI* (BII.2).

GenAI can produce "*multiple versions of one conceptual idea with many genres in seconds, which previously several designers had to work for weeks visualizing up to five drafts"* (CII.4). Creators can then compare and select from this larger set. GenAI might also produce higher quality results in some situations: "*GenAI has no feelings, won't get tired, but people will. When we are tired, we might produce inferior output unintentionally. This is creative work, not making widgets mechanically, when we are bored or annoyed, we can't be creative"* (CII.1). A number of examples are presented in Table 9, with indications of whether GenAI influenced the quality, quantity, or speed.

4.2.2. GenAI as a communication facilitator for collective iteration

In this section, we explore the role of GenAI as a communication facilitator in group work. As individual use of GenAI developed and improved, it began to be applied as a communication facilitator in a live collaborative setting. For example, in one management meeting, during the discussion of an emerging concept, a participant said, "*let's use GenAI to have a few prompts of […], that some of you may have better ideas of"* (OB.10) or, in another meeting, "*let's check GenAI now for our discussion of […]"* (OB.13). During these meetings, participants also presented collections of pre-recorded GenAI outputs on-screen for review, discussion, and selection, but also conducted further real-time prompting. GenAI was able to develop, visualize, and interpret ideas to support this real-time communication. Collective GenAI application not only takes place during management meetings, but also during working meetings between creative actors. Table 10 presents further representative quotations.

During group meetings, the collective application of multiple GenAI still generates outputs for sequential follow-on routines for further work by different actors, but the level of output is enhanced. The characteristic of GenAI to produce outputs of a sufficient quality at a rapid rate, coupled with the expertise of the design and innovation actors to produce suitable prompts and to evaluate the outputs, has changed the way routines are carried out (the performative routines), as well as their outputs.

The next two sections elaborate on the dynamic impacts that GenAI introduced to the artistic creation routines.

4.3. GenAI adoption introduced performative emergent variations for routine cluster

The individual use of GenAI applications produced a number of variations to creativity and innovation routine clusters.

First, GenAI brought performative improvement regarding speed, quality, and quantity in many, but not all, tasks. At present, GenAI adoption is largely restricted to the creation planning and designing phases. Set designers must produce accurate, dimensioned drawings for stage construction, and "*this 2D-to-3D works is still manually carried out currently"* (NII.7). They had tried market-available 3D models of GenAI and were not satisfied. For dynamic visual designers, there were also no currently available GenAI models that would produce high-quality streaming outputs. For these applications, an interview participant contended: "*There may be some GenAI in the market claiming to be useful, but either the quality of GenAI is low, or the extra effort in adjusting the output is more than when they create from zero"* (CII.1). The uneven advantages were generating routine productivity imbalance.

Second, for routine clusters, GenAI applications by individual creators, such as designers, screenwriters and musicians, use one or more GenAI tools to augment their individual creative process, often in different ways. For example, "*I like to feed random ideas to GenAI to help me clear my thoughts, but I know others may have a clear direction first before prompting on GenAI"* (CII.3). Creative actors also use different tools depending on the needs of their role and their individual preferences: "*Someone may like Stable Diffusion more than Midjourney, but I don't, it depends on working customs"* (CII.5). Moreover, CII 4 stated:

> *Previously, without GenAI … we would surf online or in databases for a long time to get ideas and inspirations of character, color, scene space, etc.; its time consuming … But with GenAI, we start from coding inputs. But there have been occasions that GenAI didn't understand what we wanted or maybe hadn't been trained or its training datasets had no specific type of pictures we wanted. So, we work by mixing the traditional way and the GenAI way.*

Furthermore, where multiple GenAI tools are used, the working inputs for outputs generation are enriched. For example, professionals for streaming production may use text GenAI and image GenAI, although they intend to create dynamic visuals.

> *For what stories to tell, I use but don't rely too much on ChatGPT as we have our concept creation of stories by ourselves. For the element of video, I can use some ideas from AI images as static elements. No AI can produce final output; it is always step by step.* (CII.3).

In addition, GenAI can expand professional role and capability beyond their previous expertise, as illustrated in the following quote

[1] The study participants use the terms "GenAI" and "AI" interchangeably in their interviews and our observed meetings, and they do not use particular AI other than market-available GenAI. So, we record this first referred-to "AI" here, but to avoid confusion, all other "AI" in the representative quotes of this paper have been revised to "GenAI".

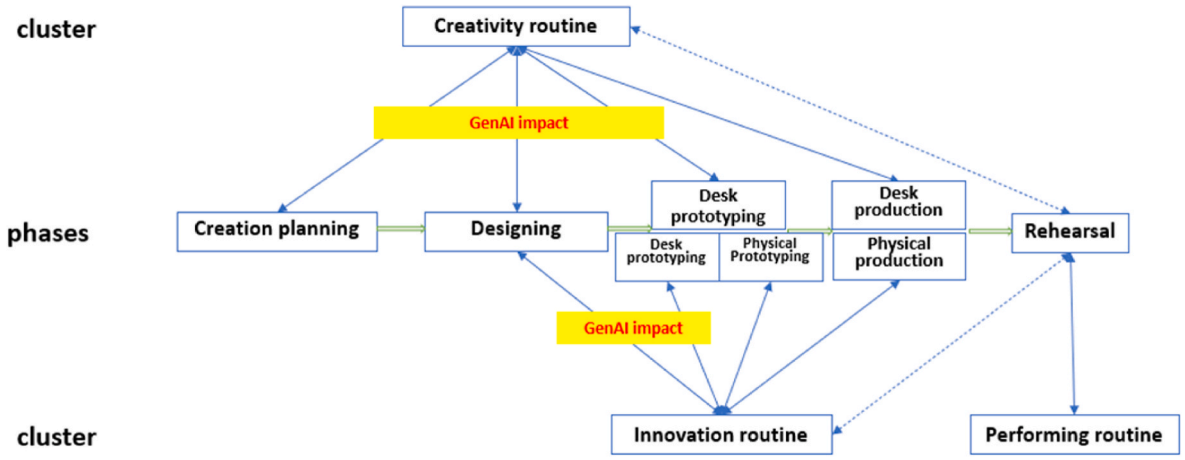

Fig. 3. Artistic creation routine-adapted.

Table 9
Representative quotes of productivity improvement by GenAI application.

Representative quotes	Quality	Quantity	Speed
GenAI can do repetitive and tedious tasks (such as experimenting with presenting effects of creative design ideas) for us, it does improve my work efficiency at least 50%. And surely the more trials comparison, the higher outcomes, assuming we are not spoiled by too many choices leading to an indecisive mind. (CII.4)	✔		✔
The usefulness of GenAI is determined by the types of GenAI and phases of our design. When we write our story of the visual, we use ChatGPT, which improves productivity by 10%. When we make creative concept images, Midjourney and Stable Diffusion can be a good creator to improve productivity by 70%. Then, with the streaming visual producing, GenAI is reduced to 5% improvement. (CII.3)			✔
In my view, GenAI improved function productivity in the creation phase around 10-fold. I feel like I suddenly have 10 additional line managers. We are looking forward to the fact that some GenAI can improve or develop 3D model capability. Maybe we can improve another 10-fold productivity or even exponentially. (KII.2)		✔	✔
I feel that GenAI improved my work by 30–40% for completion of tasks, in aspects of idea quality, space relation of scale proportion, and color choices patterning. (NII.11)	✔		
Previously, if we got a general concept from the director or director team, we would at most try three to five different conceptual image series to visualize their thinking by our half guessing to let them choose what they want to further develop. We can't do much, as these works were demanding; we have to put in considerable labor and spend several weeks on something that may be dumped right after finish. Now, with GenAI, we might get 100 series of conceptual images in a couple of days as alternatives. (CII.1)	✔	✔	✔

Table 10
Comparison of GenAI as a working tool or communication facilitator.

Representative quotes	Individual or collective work
We used GenAI for the suggestions of creation in sequence, for show H, we got some ideas from ChatGPT, then we transferred this text as prompting inputs for Midjourney for conceptual images as the foundations for dynamic visuals. At the end of the day, visual is just consecutive images. (CII.9)	Individual & collective
Previously, we had a whole day meeting to discuss how to present one piece of concept. We talk and, at best, we prepare in advance some examples from the database or use real-time googling examples in the shared screen of the virtual meeting or conference room TV screens … it's slow. But now, if we want to do any variations, we do it in real-time with GenAI. The outputs are immediately available, then further discussion, further inputs, further develop rounds of rounds. Those one-day-meeting results may be equivalent to several weeks' outputs in this respect. (CII.2)	Collective
Previously, when the director, producer, or other major creators wanted us to work on some novel creativity in planning, the designers had to make notes and do these testing drawings and modeling after meeting for a couple of days or weeks and, when we finished, the big guys may forget it all or have changed their minds already. What a waste, you know, right? But now, we open GenAI on the computer, what they say, we do the inputs, they see the outputs, pass or retain or further prompting a few rounds, modify and decide, any ideas discussed, we got the decision right then right there. (CII.6)	Collective
From what is generated by AI, we can further finetune it by AI follow-on work. For example, we can ask GenAI to generate follow on sentence or ideas by more prompts. In this background view image from poem, we can ask GenAI to add a girl into it. Then we request some change for the details of character of the girl's face. With the initial prompt, the overall theme harmony in each detail of the outcome is satisfactory. (CII.5)	Individual & collective
Application of GenAI for our designing and production is a very interactive and iterative process in that it is not one input for one output and done; we have to continually do small adjustments and modifications according to what GenAI gave and what we wanted until we feel it is right. We do this by ourselves when we design independently, or sometimes we want to discuss with each other, so we do the trial prompting together. (NII.8)	Individual & collective

from designer CII.7:

> *We have tried some slides making GenAI for the initial concept presentation going to potential pitching deals, as we don't want to invest too much labor and time for a vague possibility. We have checked the slides page by page. It's logically consistent, although we surely have to make significant improvements, but the basic quality is not bad.*

Previously, the designer worked on creating visual concepts, handing over the images to other colleagues who then added the images to slides for discussion in meetings. He was often not completely happy with how the slide colleague organized the images that he handled, but it was complicated to communicate and sometimes not possible to meet and discuss these issues. Now, besides utilizing image GenAI to enhance his

visual work, by also using PowerPoint GenAI, he can produce an initial version of the slides including his images and in better alignment with his creative vision, rather than sending his images to the professional slides colleague to further work on. Through the use of GenAI, the role of the designer has expanded to include some of the work usually carried out in a separate phase, in addition to producing the images faster and sometimes with improved quality.

Hence, individual application of GenAI in single routine change may lead to cluster variations, including routine pattern interface change, path discrepancy, and outputs expansion resulting in path overlapping. Moreover, managers in our study are considering the effect on the overall process. For example:

> *The structural adjustments might be necessary when the efficiency introduced by GenAI is significant enough.* (CII.1)

> *Of course, I am thinking of the function reorganization, labor cost and efficiency, but I won't say anything as, at the moment, it also depends on the advancement of GenAI, so we wait and see.* (CII.3)

4.4. GenAI adoption impacts on the ostensive aspect of the artistic creation routine cluster

The collective use of GenAI applications produced variations to routines' feedback loops. These interactions occur within and between the creativity and innovation clusters.

GenAI enables simultaneous idea inspiration, problem searching, and solution searching, transforming the ostensive aspect of routines. For example the director team have changed from *"previously sitting, talking, making notes, and after meeting handle some ideas to visual team to draw simple line picture"* to the director, the musician, scriptwriters, and visual designers *"talking, prompting GenAI, screening, deleting and saving potential ideas and respective images for further work"* (CII.5). In this example, the creative routines are not only related to the overall project concept, but also to very specific creative artifacts such as stories, images, and songs, each of which can be developed prompted from multiple types of GenAI.

We found similar integration for innovation as well. The producer team will now invite the technician team to attend their design meeting for a first-round screening of solutions, where they can provide immediate feedback:

> *They would not let us attend previously as those discussions were prolonged and we would have little clue after a one-day meeting, but now, with GenAI produced images, we have an immediate view of what they are thinking. If it is unrealistic by our experience, we can point it out directly.* (NII.9)

In this example, problem searching, solution searching, and preliminary validating for innovations occurred in a single real-time event. The ostensive change to a collective working scenario means that previously sequential activities can now be implemented simultaneously.

Moreover, we found possible cross-iterations between creativity and innovation by analyzing the notes taken during observation OB.11:

> *The executive director presented a [GenAI] concept drawing of the stage, including an artificial pond with a water depth of 5cm … The executive director commented that, since there would be a pond on stage, then there was less possibility for a floor LED for video content. When the designer said the stage should be able to rotate to explain their preference for a round stage, the chief technician joined the discussion about the speed of the rotation and electricity arrangements as there would be water on the stage. There was nothing determined as they rushed into other meetings, but the designer saved GenAI outputs' images.*

In this example, the executive producer and chief technicians, based on their observations of the GenAI images, embarked on a discussion of innovation problems, such as whether the stage will rotate, and solutions, such as cost and maintenance, from their knowledge and experience. Such real-time discussion is again different from the previous sequential flow of innovation solutions search. In short, the application of GenAI as a working tool and communication facilitator not only mixes activities within clusters of creativity and innovation but also enables multiple activities of creativity and innovation to occur in one local event with the expanded actor group. The mixing up of cluster routine activities is summarized in Table 11. In this table, the left and right columns are the creativity and innovation clusters with necessary episodes as it always is. In the middle column, the two blue lines delineate the scope of the mixture of routine episodes. Now in one meeting event, the sequential episodes of generation problem defining, problem searching, framing, solution searching and desk iteration of creativity routine cluster and the sequential episodes of problem searching, framing and solution searching of innovation routine cluster can occur as iterative loops within moments.

To conclude this analysis of the ostensive aspect of artistic creation routines, it is clear that they have been changed by the collective applications of GenAI, resulting in a much increased scope for the simultaneous exploration of ideas, problems, and solutions in both the creativity and innovation phases.

5. Discussion

The benefits of AI, such as improved operations and higher productivity, have previously been observed in the manufacturing context (Mariani et al., 2023). However, AI can also indirectly enhance the innovative behaviors of employees by assuming the repetitive mundane tasks, enabling the human to focus on innovation (Verma and Singh, 2022). Better outcomes in idea generation were supported by the significant information-processing capabilities and the non-local searching scope of the GenAI tools (Haefner et al., 2021). In this study, we investigated the impact of GenAI on artistic creation routines and for the individual application of GenAI, we also observed higher quality, greater efficiency, and better innovations.

Our empirical contribution aligns with extant academic discourse in that GenAI have been adopted by individual creative professionals. Their effortful accomplishments and emergent accomplishments (Feldman et al., 2021) of GenAI application led to increased level of efficiency and quality, allowing them to execute individual routines more productively and expanding their capability to additional areas. Such applications and impacts are aligning with the extant GenAI studies of productivity enhancement by exceeding human limitation of searching, exploring and inspiration (Haefner et al., 2021; Posen et al., 2018; Singh et al., 2024), rather than replacing repetitive work in some of the extant literature (eg. Ooi et al., 2024). The individual actors and contexts (Deken et al., 2016) relevance of new artifact application in routine dynamics reflected in the varied extent of productivity enhancement and uneven extent and incomplete application scope of the entire routine.

We complement extant literature by our empirical contribution presenting that the group iteration convention of artistic creation demands and enacts the collective application of GenAI communication facilitator that enables real-time feedback and rapid iterations. In such circumstance, GenAI acts as both working tool and medium and the previously sequentially interdependent routine activities of problem searching and solution searching occurred in one local event. It challenges the academic knowledge of routine transformation with new digital artifacts as novel tool may induce change of routine interfaces or paths (Pentland et al., 2020a,b).

5.1. Theoretical implications

Artistic creation relies on professionals' sequential and iterative contribution, which can be considered as routine clusters (Kremser and Schreyögg, 2016) of interdependent, coordinated (Sailer et al., 2024),

Table 11
Artistic creation episode routines with GenAI.

Creativity routines in sequence	Routine sequence mixing enabled by GenAI	Innovation routines in sequence
General problem defining	Now these routines can take place in one local event by collective application of GenAI for communication and working	
Problem searching		Problem searching
Problem framing		Problem framing
Solution searching		Solution searching
Solution desk iteration		Solution desk quantifying and validating
Solution desk finalizing		Solution physical experimentation
		Solution physical finalizing

and cascading episodes (Deken et al., 2016). We identify its impacts on innovation routines, first by individuals as a tool for desk ideation and iterations, and second in collective applications as a medium for group evaluation and iteration. The routine cluster perspective helped us to view GenAI as an artifact for interdependent and interactive patterns (Goh and Pentland, 2019) in a web of interactions (Pakarinen and Huising, 2023).

Our study found significant change in these routine clusters with the application of GenAI, which can be seen as an emergent accomplishment (Feldman et al., 2021). Deken et al. (2016) discussed actors flexing, stretching, and inventing routine outputs. In our study, the individual use of multiple GenAI tools extends routine outputs, changes the relationship with the follow-on routines. In this regard, we complement the extant literature of coordinated cluster dynamics which can come from effortful accomplishments (Sailer et al., 2024), as we find that these individual emergent accomplishments also change the pattern of routine clusters, changing the routine interfaces and resulting in path divergence (Goh and Pentland, 2019). That is, the deliberate application of GenAI changed the nature of the routines, and so changed the routine dynamics.

For the collective application of GenAI in group work within routine clusters, the impacts can be seen as changing the sequence of problem and solution searching and pairing. Extant papers discussing GenAI stress its capacity to expand the problem and solution pool (e.g. Bouschery et al., 2023) and to offer improvements in problem and solution searching (Singh et al., 2024). In this study, we observed GenAI as a digital working medium (Anthony et al., 2023) for real-time coworking and communication, where it enables simultaneous problem and solution searching and debating. This presents a novel finding with respect to the effect of GenAI on artistic innovation as routine clusters, changing the design and logical progression of activities alongside the outputs of those activities. Hence, the collective application of GenAI as an interpretive working and communication tool changed the ostensive element of artistic creation by combining the phases of search, problem framing of and solution finding, and increasing the scope for cross-cluster mixture of creativity and innovation in one local event.

Our investigation of widespread GenAI adoption in artistic innovation is aligned with predictions by Pakarinen and Huising (2023) that AI benefits are embedded in professional networks of interactions. Compared to the extant comparative and empirical discussion of varied AI impacts on individual levels (Bankins et al., 2024) in single tasks (Jia et al., 2023), this study shows that human–AI collaboration can also influence group working and routine clusters. GenAI enables participants to jointly engage in exploration of ideas, problems, and solutions simultaneously for artistic innovation. Hence, adopting routine dynamics—in particular, the cluster perspective—to study GenAI applications, we provide strong empirical evidence for the prediction of AI triggering the change of the innovation process (Haefner et al., 2021). We also extend the static system view of AI adoption and human–AI collaboration (Anthony et al., 2023) by analyzing the processual impact of GenAI on routine clusters in artistic creation. It is clear that the scope of human-AI collaboration must expand to include group discussions and collective problem solving. For routine dynamics theories, we share an empirical possibility of GenAI leading to a significant ostensive routine change, which in our case study followed a series of local modifications rather than a top-down system transformation. This pattern of routine dynamics might apply beyond the creative industries, but of course to test that idea, more research is needed.

For routine transformation, the firm-level application of a new artifact could be an explicit tipping point of an avalanche on the entire system, leading to other changes and incremental reconfiguration for discontinuous change (Girod and Whittington, 2015). For example, Pentland et al. (2020a,b) discussed how a system settled into a new regime after self-organizing. In contrast to this previous literature, routine dynamics in ostensive modification in our case benefited from the collective use of multiple GenAI tools. Our study presents a significant change of both the performative and ostensive aspects of routines without a deliberate, systematic transformation. In this study, the firm-level application of GenAI has been realized both by individual behaviors and by group collective behaviors, and both introduce routine modifications. Routine modification and recreation with simultaneous persistence and emergence are an outcome of emergent modifying and complex assemblages of socio-material practices (D'Adderio and Pollock, 2020), which is a difficult process that often fails (Glaser, 2017). In this research, rather than introducing systematic drifting and significant process and structural changes into new routines (Pentland et al., 2020a,b), the firm-level GenAI application brought routine modifications with the ostensive change driven by actors' emergent accomplishments, where they discovered that the collective application of GenAI could combine multiple activities in one local event, thus changing the ostensive sequence of routines.

Meanwhile, as firm level transformation analysis from this study is in consistent with literature stressing the importance of actors. The application of GenAI started from a few dispersed routines by autonomous activities of actors in those routines to improve productivity and generate additional outputs. Actors are critical for routine change. For instance, Bapuji et al. (2019) contended that the importance of the individual participant's understanding of the routine change and their action and interactions with respective artifacts impact the outcome of routine implementation. Technology as an artifact adopted by human

workers could function as a tool, supporting task implementations, and as a medium, building common ground to enable collaborations among different human groups (Anthony et al., 2023). It has been reviewed and concluded that, for the application of AI outputs, medium-level employees with moderate expertise may benefit most from AI application whereas senior professionals with higher expertise may trust AI outcomes less although they are better to incorporate human knowledge with AI outputs, and lower workers are weaker in evaluating and effectively utilizing AI outputs to assist them in their work. GenAI, however, introduces the most gains to the productivity of skilled workers in simple tasks (Bankins et al., 2024). In this study, we present integratively. Lower- and medium-level professionals utilize GenAI as a working tool in their daily work tasks because they work with computers on their desk, whereas higher-level artists are not using GenAI hands-on, but they understand and leverage on GenAI during real-time group work of discussions and meetings to participate in rounds of input–output loops with instructive orders.

5.2. Practical implications(mainly streamlined with sequence adjustment to make it easy to follow)

The effect of GenAI on artistic innovation was observed in our creative industries setting, through local adaptations and variations (Berente et al., 2016), organizational context of artistic innovation routine clusters allow for the absorption of GenAI as an external technological artifact. Individual applications of GenAI can offer higher productivity and improved outputs by generating a large volume of output at an acceptable quality level for the conceptual design stages (Murray et al., 2021), reducing the need for time-consuming manual iterations. Similarly, GenAI can also be applied in a collective work setting, allowing real-time review and iteration, shortening the time required to produce a feasible solution that meets the design concept requirements.

Interaction and collective improvisation are critical for the creative innovation outcomes (Audretsch et al., 2023; Meziani and Cabantous, 2020). Collective group work is a long-recognised phenomenon in artistic creation (Hatcher et al., 2018). Iterative dynamics are also key to artistic creation routines, whereby repeated recursive refinement is a key element in the creative process (Clegg and Burdon, 2021), which ensures the potential to introduce new and different adaptations and variations (Berente et al., 2016). Artistic creation routines contain inherent dynamics of situated performing variations of recursive group iterations (Hatcher et al., 2018; Paris & Ben Mahmoud-Jouini, 2019). When artistic creation routines embrace GenAI, a live group creation setting allows the designers to evaluate the visual, aesthetic, and graphical appeal and, at the same time, the technicians can evaluate the practical considerations of the new idea and reveal constraints or suggest changes or alternatives based on their experience and initial impressions. Here, GenAI is applied as a collective work tool and communication facilitator with extended participants, from independent and nonsequential activities, who were previously unable to join the talk and discuss effectively. Hence, the situated performing (Goh and Pentland, 2019) of GenAI by creative professionals can be used both individually and collectively, and we would encourage creative firms to explore its use in both settings.

Innovation management involves complex decision systems that require resources, administrative governance, and creative control, especially where GenAI is being applied in unfamiliar areas (Haefner et al., 2021). The potential for automation depends on whether the human components and intervention are indispensable (Fleming, 2019), and in our case study there were two critical areas where human intervention was essential. First, design expertise was essential in creating suitable prompts and in evaluating the quality and suitability of the outputs. Second, the GenAI tools were not ready to be used in the physical production (innovation) elements. Hence, the decision on whether to adopt GenAI should not rest on how well it can replace people, but on how much it can support human labor to complete their work faster and better. Further, when encouraging professionals to apply GenAI, organizations must also consider the requirement for developing new skills to better understand and deploy AI technology (Pakarinen and Huising, 2023).

5.3. Limitations and future research

The main limitation of this research is that we only studied show production in one country as a representative case for creative industries. Although we have justified the generalisation value of our case in the introduction and the main characters of recursive iterations in the creative industries are reflected in our data and analysis, future studies in different cultures and in other sectors may reveal different findings. For example, music production would be very different from show production and the GenAI potentially involved would be less likely to heavily rely on image GenAI. Hence, future research of music GenAI by independent musicians and major labels would be interesting. In addition, GenAI adoption is a new phenomenon with rapidly improving quality. GenAI tools including text, 3D models, voice, image, and video are particularly relevant to artistic creation. At the moment, some GenAI tools are not sufficiently well-developed, such as those for video and 3D model, whilst others are working with relative higher quality. The future progression of GenAI may change the scope of GenAI in the creative industries and beyond. Relevant to these advancements, we suggest future studies in other regions and in sectors, such as film production and digital gaming production in Western countries.

The second limitation is the generalisation of GenAI impacts as collective application. Incorporating AI-human interaction as an interdependent collaboration (Lichtenthaler, 2018) may influence job, task design, and business routines (Bankins et al., 2024). GenAI enabled different professionals to communicate, triggering change in the ostensive aspect of artistic creation routine, rather than as a systematic redesign of the routines. Group working is a common topic in creativity and innovation (Amabile and Pratt, 2016; Harvey and Berry, 2023), whereas human–AI collaboration with groups of humans in one local event is not sufficiently investigated in other managerial studies. Further research is needed on whether the group-AI interactions are also taking place in other settings.

5.4. Conclusion

Benefiting from the empirical context of the creative industries, this study advances management research into GenAI impact. To the best of our knowledge, we are the first to apply routine dynamics as the theoretical lens for the study of GenAI. Our key finding is that in creative industries setting GenAI enables a new form of human–AI collaboration with groups of diverse experts making collective use of GenAI to generate and evaluate new solutions in real-time. Such GenAI application as both digital working tool and medium changed the ostensive aspects of artistic creation routing clusters without systematic transformation.

CRediT authorship contribution statement

Wenyi Chu: Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **David Baxter:** Writing – review & editing, Supervision. **Yang Liu:** Supervision.

Declaration of competing interest

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