Organizational information creation through a design game: A sensemaking perspective

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ABSTRACT

Information creation taking place in the use of an organizational design card game, Topaasia® is discussed. Using 18 video-recorded play sessions, the researchers analyzed the ways in which players make propositions based on cards and raise points or further development in the organization, as well as discuss contextual factors. The sessions were analyzed on topical turn-taking and by using the Systems Intelligence Inventory. Through these processes, the study shows the importance of breaking organizational communication genre conventions for the goal of revealing tacit information and for the creation of new information. The research thereby contributes to studies of organizational information creation and sensemaking.

1. Introduction

This case study takes a sensemaking approach to organizational information creation through design gaming. Its case example, the card game *Topaasia*®, is a game in which players first decide on topics for discussion (e.g., "the most challenging", "our strongest advantage") and play cards from their hands (e.g., "marketing", "manager's social presence", "communication"), which are then discussed for a limited time (typically three minutes), until one of the cards is collectively seen as the most important for that particular topic. At the end of a session, the players decide which of the topical decisions is the most important for further action (the "top thing" - the game's name is a wordplay on that and the *gem* topaz). The results are then written down and decisions are made on who will advance the topic further in the organization and how soon (Hannula & Harviainen, 2018). The game is optimally played at regular intervals and with sufficiently diverse teams, so that new topics may arise, and new decisions can be made, both because the organization's context may change, and because not every card will be dealt out during a single session (Hämäläinen, Kumpulainen, Harviainen, & Saarinen, 2020).

One of the central purposes of Topaasia® is to provide the possibility of inclusion of the sense-making capabilities of people outside the management elite, through turn-taking and game rules. This is one of the central advantages of design games in general, as they foster collaboration and cooperation (Brandt & Messeter, 2004). Organizations have a

tendency to exclude or disregard these capabilities, due to power structures and hierarchies manifested in discursive limits (Vaara & Whittle, 2021). Such limits prevent the creation of sufficient information needed for truly rational decision-making and leads to "cults of the manager" and the acceptance of bounded rationality at the top (Simon, 1955), instead of opening the processes for all relevant stakeholders.

To solve this situation, Topaasia® breaks what Vaara and Whittle (2021) call the genres of organizational discourse, the accepted forms and patterns in which views about the organization are presented and in which they are accepted for further discussion. By inviting players, based on pre-agreed upon topics and the cards dealt to their hands, to debate the merits of different ideas, the game temporarily flattens existing power structures and becomes a boundary object enabling information creation (Hannula, 2020; Hannula & Harviainen, 2018; Star, 2010).

The study contributes to sensemaking and information creation research by using an analysis of Topaasia® play sessions to examine the discursive processes underlying organizational sensemaking (as per Vaara & Whittle, 2021) and the ways in which also unspoken communication contributes to it during such processes (Törmänen, Hämäläinen, & Saarinen, 2021). The focus of the study is on how information is being created, not what information the play sessions produced. Doing so carries a wider significance for understanding the creation itself.

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2. Problem statement

This study addresses the game *Topaasia*® as a system of becoming-informed (as per Buckland, 1991). As pointed out by Vaajakallio (2012), design games are simultaneously tools, mindsets, and structures. In the case of Topaasia®, all three of these functions appear to be important for information creation. The game works as a tool in the sense that it is utilized as part of organizational workshops, in a manner comparable to other tools such as world cafes or SWOT analyses. It provides a mindset, in that people may enter the playful ("paratelic"; Apter, 2007) thinking mode able to deal with visioning and hypotheses, which is needed for strategizing and organizational development (Vesa, den Hond, & Harviainen, 2018). Participants can also use the play as a way to avoid organizational consequences for raising inconvenient issues that need to be discussed. And finally, the game provides structure for organizational dialogue (as per Tsoukas, 2009).

This study focuses on the situations where information is being created and analyzes the ways in which the creation happens. The game provides a fascinating case example for this, because of its structured play, focus on topical relevance, and the social contracts surrounding it. While information creation appears to hold a strong connection to the information being shared and/or used, this study has, due to both research design intent and in order to respect the confidentiality of the organization that participated in this longitudinal study, chosen to limit the analysis to the play sessions themselves, including pre- and after-discussions. Wider contextual issues are therefore only mentioned in the analysis in the cases where study participants stated that they affected the information creation that took place during play.

Earlier studies (e.g., Hämäläinen et al., 2020; Hannula & Harviainen, 2018) have shown that Topaasia® provides positive results as an organizational learning tool. What they have not yet done is show the reasons why, but their suggestions on e.g., dialogue structuration as particularly important work as useful guidelines for further research, including this study. Of particular interest is the conversation structure, which Hannula (2020) noted in a similar but less structured game as very valuable, because it makes information and knowledge creation dialogues perceivable and easy to document and analyze. As a result, Topaasia® can be utilized as a remarkably useful test case to see how organizational information is created. The research gap addressed by this study is that very little is still known of information creation itself, as opposed to the steps that follow it. Library and information science has been more interested in information sharing, while business sciences have in turn focused on the externalization of existing knowledge. The study of Topaasia® here should therefore be first and foremost seen as an analysis of structured organizational dialogue, not as the analysis of a single game, in how it contributes to understanding the creation of information.

The following research question was asked: *How does Topaasia® play (game playing) function as organizational information creation?*

3. Literature review

3.1. Design games

Topaasia® is part of the wide family of design games, particularly a subset of such games made for organizational development. Design games are very diverse as a concept. The term encompasses any game used for design purposes, ranging from digital, board and card games to physical role-plays (Harviainen, Vaajakallio, & Sproedt, 2016). Many of them have very little in common with each other except the context in which they are used. They are usually not competitive games, but game-like rules systems used for structured turn-taking, idea creation and the fostering of a suitable mindset for enacting innovation and change (e.g., Hannula, 2020; Vaajakallio, 2012). As gamification (the use of game elements in non-game settings; Deterding, Dixon, Khaled, & Nacke, 2011) is seeing increasing use in also organizational development (Vesa

& Harviainen, 2019), design games are being recognized as an important addition to the toolkit that already spans over seven decades of business simulations and games (see e.g., Keys & Wolfe, 1990).

Design games are used to share participants' earlier experiences and to plan new futures (Vaajakallio & Mattelmäki, 2014). While they are most common in the design of services, this dual nature enables them to also function as tools for organizational sensemaking and information creation. Extant research has shown that design games enable reflection during play (e.g., Hannula & Harviainen, 2016).

3.2. Sensemaking and sense-making

Sensemaking itself lacks a clear definition (Brown, Colville, & Pye, 2014). Following Weick (1995), it is usually seen as meaning-making in group processes. Organizational sensemaking is social and collective (Tsoukas, Patriotta, Sutcliffe, & Maitlis, 2020; Vaara & Whittle, 2021; Weick, 2003). As pointed out by Weick (1995, p. 13), it is reliant upon the creation of new information. Whereas the process of interpretation can be considered to remove ambiguity by using existing information in new ways, sensemaking requires information creation (Brown et al., 2014). This takes place in organizations through fruitful dialogue, but all dialogues are not equal for that purpose (Tsoukas, 2009).

Sensemaking, and its companion, sensegiving (influencing the sensemaking of others; Vaara & Whittle, 2021), often rely on negotiated visions. The question of who is able to influence the decisions (i.e., who is a sensegiver reducing uncertainty) becomes therefore highly important (Gioia & Chittipeddi, 1991). While this is seemingly different from the sensemaking theories used in library and information science, particularly that of Dervin (1998), the idea is in fact complementary. Whereas for Dervin, sense is made in order to cross a gap in the information landscape, for Weick (1995) sensemaking is mainly done retroactively, to make sense of situations that took place. This should be seen as a mirrored process in which ambiguity is realized and dealt with, through information creation, both before and after an information gap happens (Gioia & Chittipeddi, 1991). This study follows that dual interpretation of the concept; sense is made when sufficient information to cross a gap in the information landscape is either acquired or created.

3.3. Information creation

The concept of information creation, like sensemaking, is elusive. In general, particularly within business sciences, focus has traditionally been on knowledge creation (see Hannula, 2020, for a play-related summary) and the ways in which that knowledge can be transferred through processes such as documentation and information and communication technologies, particularly in the context of innovative capabilities (e.g., Galliers, 2004). Within information sciences themselves, the area likewise has been largely understudied (Gorichanaz, 2019; Huvila, 2011), and several related terms with slightly differing connotations potentially exist (e.g., making, production; Huvila, 2022). A porous borderline likewise exists with data creation (e.g., Checkland & Holwell, 1998), made very complicated by the various definitions of what exactly counts as "information" or "data".

Nonaka (1987) sees information creation as a part of innovation that is based on interpersonal interaction, in which the quality of the information matters more than the quantity. Fulton (2017) perceives it, in a hobbyist context, as user-generated content. Both connect information creation closely to information sharing. The means and purposes of sharing and use affect what kind of information is being created (e.g., Duxbury, 2018; Huuskonen, 2014;). In contrast, McKenzie, Davies, and Williams (2014), building upon Trace (2007), discuss information creation in the context of personal information management. What all these approaches have in common is that information creation appears to be an interactive process, based on individuals' existing knowledge. In Gorichanaz' (2019) terms, which this study follows, it is the application of information for the creation of new information.

4. Methodology

4.1. Research setting

This case study is based on 18 recorded sessions of Topaasia® play in a major Finnish corporation working mainly in the financial sector. The sample of play sessions took place between August and November 2018, in a structure where six teams each played three interlinked sessions over the course of approximately three months. The teams wrote down play-created goals to accomplish after each session and performed a retrospective discussion at the beginning of their second and third sessions, to ascertain whether the goals listed after the previous sessions had been forwarded or realized. Participants (*n* = 41) came from areas such as intra-organizational services, marketing, sales, and sales support, and in some cases overlapped with each other (e.g., groups D and E were parts of the same task area in the organization and shared the same notes between sessions but consisted of completely different people). As a result of this diversity, topics of play varied heavily from one group to the next. The central themes were either "risks" or "cooperation", which each group interpreted their own way, based on their roles in the organization and the topic cards selected for the session. The groups and their topic cards are described in Table 1.

4.2. Data collection

The sessions, which lasted between 30 and 45 minutes each, were recorded on video by the authors with written permissions from all participants. The authors also observed the play either together or separately while it was taking place, making notes and discussing the observations with each other after the sessions. Players who gave

Table 1
Teams and session topics.

S(p, g)	Topic cards	S(p, g)	Topic cards	S(p, g)	Topic cards
A1	Most serious	**A2**	Most probable	**A3**	Most important
2	Most inspiring	3	Strongest	5	Most inspiring
2f	Most challenging	1f2m	Most inspiring	2f3m	Most serious
B1	Weakest	**B2**	Weakest	**B3**	Most inspiring
6	Most probable	6	Most probable	5	Most challenging
4f2m	Most difficult Most inspiring	4f2m	Most difficult Most inspiring	3f2m	Most important
C1	Weakest	**C2**	Most inspiring	**C3**	Strongest
4	Most serious	4	Most challenging	4	Most important
3f1m	Most challenging	3f1m	Most serious	3f1m	Most inspiring
D1	Strongest	**E2**	Most challenging	**D3**	Most serious
4	Most challenging	3	Strongest	4	Most important
4 m	Most important	1f2m	Most frustrating	4 m	Strongest
F1	Most challenging	**F2**	Most inspiring	**F3**	Most important
8	Most engaging	8	Most important	8	Most challenging
7f1m	Most frustrating	7f1m	Most frustrating	7f1m	Most probable
G1	Most important	**G2**	Most inspiring	**G3**	Most important
8	Most difficult	8	Most frustrating	9	Most inspiring
8f	Most inspiring	8f	Most important	9f	Most challenging

Recorded play sessions (S), number of players (p), gender division (g): female (f) and male (m), and topics. Group B elected to play more than the required three topic cards per session. The topics "probable", "difficult" and "serious" always related to organizational problems or risks in the documented sessions. "Most important" and "most challenging" referred to development targets.

consent to having their voices recorded but did not want to appear on video attended the sessions by sitting outside of the filmed area. No noticeable influence on group dynamics was observed as a result of this seating order, nor was such reported by any of the participants.

In a digital survey administered between the sessions, approximately 95% of the players enjoyed playing Topaasia®, while about 5% did not enjoy the game (which is a slightly higher percentage than existing findings on people who do not enjoy playing games in Finland in general; Kinnunen, Taskinen, & Mäyrä, 2020). Forty-nine-point-2% found Topaasia® as useful as other organizational development tools they had tried before and 44.3% found it somewhat better than those, 3.3% found it less useful and 3.3% very much better. These numbers correspond with earlier findings, including efficient time-on-task gained from game enjoyment with the same tool (see Hannula & Harviainen, 2018).

4.3. Data analysis

The play sessions were on the first round analyzed by Harviainen using the data-based, grounded Gioia methodology (e.g., Gioia, Corley, & Hamilton, 2013). In it, concepts are initially coded by first order utterances, which are then formed into wider second-order themes, and finally aggregated into theoretical dimensions. All the steps are interrelated and conducted for the purpose of developing new findings through an at times non-linear analysis of trends and commonalities. Therefore, for example, a first order utterance was *"we need to be able to account for the varying needs of our clients"*, a corresponding second-order theme found in several sessions stated with slightly different yet similar first order utterances "sufficient ability to respond to clients' needs" and the third-level aggregate dimension formed based on this, "understanding customers".

On the second round, Harviainen did a new video analysis of the play sessions, in order to ascertain whether elements clearly related to the eight factors of the Systems Intelligence (SI) Inventory of Saarinen and Hämäläinen (e.g., Törmänen, Hämäläinen, & Saarinen, 2016; Törmänen et al., 2021; see also Appendix 1) could be found. The second analysis was done for triangulation purposes, as several parts of the information creation that take place during Topaasia® play are potentially based on non-verbal elements and cues. This has been proposed as an advantage of this type of design game, up to and including the development of specific decks for that purpose (see Hämäläinen et al., 2020; also, Fig. 1). For example, players may look for confirmation by way of a sideways glance to someone else. This corresponds to the factor Attunement on the SI inventory. It shows whether players seek silent approval for their utterances from others, and if they do, whether the person is in a
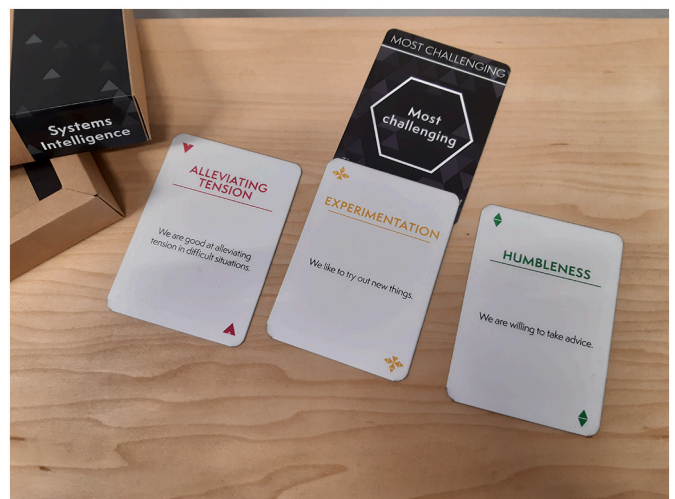

Fig. 1. A Topaasia® Systems Intelligence deck. Dozens of other tailored versions exist (Credit: Topaasia).

position of hierarchical authority or is someone otherwise framed as a cognitive authority (as per Wilson, 1983).

Sensemaking can at times be multimodal and embodied (Meziani & Cabantous, 2020), and as noted by information literacy research (e.g., Lloyd, 2007), part of the ability to make sense of a situation may be dependent on those embodied aspects. SI factors were coded based on the detected factor and the person(s) involved in presenting them (e.g., "person 3 glances at person 6 while making the proposition"). The Systems Intelligence Inventory factors were then coded together with connected demographic factors such as gender and, when known, position in the organization.

In the final round, the results of these two preceding rounds were compared by Harviainen to describe and analyze the ways in which information creation took place during play, and to observe what hindrances the game session participants mentioned as reasons for this information to be scaled and exploited (as per March, 1991) into becoming organizational knowledge and then acted upon. Given that this part of the study was focused on the moments of information creation (the play sessions, including both actual play and the surrounding meta discourses), issues of information transfer were only considered parts of the study when mentioned by the participants.

Due to the non-disclosure agreements involved in the study, the reporting uses very few direct quotes from the play sessions, and instead discusses the findings on the third-order level.

5. Results

Key findings from the study include ways in which the players' tacit information functioned as a basis for the information creation and the ways in which propositions were made while benefiting from the social alibi provided by the game. This also includes how social dynamics functioned during the play and how Systems Intelligence factors presented themselves in verbal and non-verbal interactions, influencing how propositions were discussed. The results also show a connection between information creation and the perceived lack of organizational use of the created information.

5.1. Tacit information as propositions

An example of a round was as follows (session G2, second topic in play; eight players, working in pairs): *Topic was "the most frustrating [thing]".* Participants (while happy and laughing) played the cards "Roles", "Feedback", "Situational Awareness" and "Being Methodical". While the last pair was still choosing their card, the others engaged in discussion based on the cards they still hold in their hand, i.e., the ones not selected. Some made notes on the ideas from those discussions. When the cards were presented after shuffling, participants all laughed again and verbally noted that they found the propositions relevant and recognizable. After several minutes of intense discussion, Being Methodical was selected as the most frustrating thing, based on mutual understanding that the organization had the necessary tools for people being methodical, but that these were not being used to a systematic extent (e.g., *"I try to reserve time for necessary desk work in my calendar, but the team leads keep just scheduling customer meetings on top of those times"*). Several notes were also made on how the other proposed themes related to the chosen issue, based on the discussion, and examples mentioned on how recommendations for more methodological processes have gotten ignored in the organization.

Due to the topics of the sessions (both represented by the cards and based on which team was playing and with which of its members present), session dynamics varied strongly, but in all sessions the participants stayed very strictly on topic and focused on the play. As can be expected, certain players talked much more than some others. They can be said to have guided, controlled and at times even dominated much of the discussion: They did not, however, dominate the decisions that were made. As topics changed from card to card, those who were silent for

longer periods of time suddenly became more talkative and several of them even took the lead when the subject matters appeared to match their interests or areas of expertise. In analytic terms, different parties made at different times propositions for both information creation and for sensegiving on a wider scale. This appears partially to be based on the game rules and is partially a result of the game's framing (as per Goffman, 1974): everyone invited to participate in the play sessions was asked to join because of their expert status within the corporation. These game-based alibis for interaction have been recognized as important before in game studies (Deterding, 2018), and "the safety to fail safely" is both a key attraction of the play and the reason for its efficiency as a tool (Tsuchiya & Tsuchiya, 1999).

The "fail safely" was exemplified in session D1, where one player jokingly suggested that there was no need to discuss weaknesses, and after a silent pause another player said that *"let's actually see if we can turn our weaknesses into new strengths."* The whole group quickly accepted the idea and debated whether to strengthen strengths or to deal with weaknesses.

5.2. New information

Information creation during the analyzed play sessions happened on a level not limited to just bringing forth existing tacit knowledge and allowing for its transfer (as per e.g., Nonaka & Takeuchi, 1995), but in the form of creating new information based on existing information. This is exemplified by utterances such as *"Then we could start with…"*, given in response to someone mentioning a very recent, yet unshared decision by the company board, and numerous *"how about if we…"* recommendations in many sessions, representing new innovations suggested to solve recognize problems.

The diversity of the cards assists in this. With several potential subjects in hand, each player (or pair of players, in some cases) had the possibility to choose from several options, as well as then present a perspective for how to interpret a given card. For example, the card text "the ability to prioritize" could be presented as meaning a particular person's ability, the team's ability or the organization's ability, as needed. The cards do not limit the topics, but instead open up possibilities for further discussion. They are starting points for potential dialogue, to be expanded upon by the participants. Working as seeds for information creation rather than as limitations on discussing a subject, the cards open new avenues.

5.3. Alignment and conflict

None of the recorded sessions were characterized by strong group conformity. On the contrary, the divergence of played cards per topic led to the players discussing multiple points of view, but in a loyal manner. As a result, while consensus-seeking was present in the final selection of which thing to take forward for each topic, the divergence ensured that no session degenerated to just nodding in agreement, but instead required significant communal sensemaking before a decision could be made. Games being systems of artificial conflict (Salen & Zimmermann, 2004), what can be seen here is that power can be harnessed for organizational development, in the sense of conflicts increasingly may be seen as productive tools for organizations (Rossi, 2019). At the same time, the situation displays shared alignment to not treat the play as adversarial. A good example of the typical conflict resolution was found in session B1, on the second topic: *"Yes, that is indeed a big risk. But is it the most probable risk?"* The participant indicated the acceptance of the preceding proposition and acknowledged its value and validity yet removed it from further play by referring to the task at hand and asking for more opinions.

5.4. Systems Intelligence factors

During play, opposed to the researchers' initial hypothesis, only

certain Systems Intelligence factors emerged as actions by the players. This stood in stark contrast with the presence of such factors in verbal statements and as topics of discussion. Players would typically acknowledge the propositions of others by saying that they agreed. This was often done without significantly changing one's posture or facing within the group. One particularly interesting finding was that female players were much more engaged in turning their heads towards other players (signaling Attunement and strong Positive Engagement), more likely to pick up and build upon ideas from others (the factors Wise Action, Effective Responsiveness and Spirited Discovery), and to guide discussions to mutual conclusions (Reflection). No gender differences, however, were observed in Systemic Perception (the ability to perceive wholes instead of just linear processes) and Positive Attitude (the ability to treat problems as challenges to be solved), which were verbally present from all participating players in all recorded sessions. This raises questions on wider organizational practices on, for example, who are more likely to consult others in decision making.

5.5. Obstacles to information sharing and use

A strong, recurring theme on the last rounds of play was frustration. As one participant put it during their third session: *"This topic is really relevant for us. I mean, really, really relevant. But we can't do anything about it."* This exemplifies the ways in which the play sessions created information, but not necessarily information that would translate into knowledge for people outside of the immediate playing group. The game's effectiveness was nevertheless first and foremost assessed by players (in both the digital survey and during play sessions) based on whether the created information was utilized, not by how much information was created during play. This is an instance of information sharing done for design (Sonnenwald, 1995) and in line with works that have suggested that the probability of information seeking and sharing increases, if people believe that the information they acquire and share will be used (e.g., Choo, 2006).

The negative side of this is that motivation to create information may decrease if participants of organizational dialogues do not believe the information will find use. As pointed out by Eckert, Clarkson, and Stacey (2001), this is typical in organizations, as information gets distorted in transfer and its history (e.g., reasons why certain decisions were made) is increasingly lost when that information travels up- and downward the internal hierarchy. It results in a process where the game is able to assist in the organization's exploration of newly created information, but its exploitation for wider learning within that organization (March, 1991) is lost. An example took place in session D1, where a player brought in material from a not recorded pre-study session and said: *"I took this with me, but I don't think we'll need it"*, thereby both acknowledging the preceding session and negating its results. Another example took place in session G3: when a participant told the others that the key topic of the previous session had been discussed in *"only one [normal] meeting"*, another remarked *"you got it discussed in one?"*, eliciting a round of applause with laughter from the entire team, pointing out that this was seen as a significant accomplishment. The statement by one person asked to join session F2, to which she responded *"no, I'll be working [instead]"* in turn exemplifies existing resistance to play.

The video analysis furthermore shows that participants were, despite these problems, discussing organizational issues already during the preparation stage, and long after the play had concluded, staying strongly on the topics introduced during play. The play fosters fruitful dialogue and focuses players' participation to stay on the task at hand. For example, on session A2, one player stated during the topic-choosing step that *"if we select the most serious and the most frustrating, I know exactly what should be discussed"*. The statement was followed by everyone laughing in a way that confirmed a shared understanding. This was coded as a clear case of the Systems Intelligence factors Attitude, Reflection and Positive Engagement. After raising negative topics to discussion on the first rounds, many of the teams specifically wanted to discuss positive topics during later rounds, which points to development of the groups' ideation, but may also signify exhaustion with pointing out persisting problems.

6. Discussion

Understanding how the information creation takes place requires a wider comprehension of how the play functions and how players possibly relate to it. In this section, the play is contextualized with existing research, to see how sense is made through the play processes.

6.1. Turn-taking

One of the key reasons suggested by Hannula and Harviainen (2018) and Hämäläinen et al. (2020) for why Topaasia® works well is structural turn-taking, which has been noted as significant in also other design games (e.g., Hannula, 2020). Topaasia®, however, combines turn-taking with the game acting as an alibi for being openly but safely critical about existing situations, practices and trends. The alibi arises from the cards which provide ready concepts, one of which has to be used by each participant. The gameplay thereby eases proposition-making.

Structured turn-taking permits information creation and allows for every player to have a chance at being heard. The most significant finding here was therefore that no one stayed completely silent in any of the sessions. All players participated in the information creation, both by bringing forth tacit knowledge and by engaging others in discussions that led to the creation of new information.

The ways in which Topaasia® functions based on alibi-protected, card-based propositions makes this possible. The cards shield a critical person from consequences, while allowing them to present a potentially valuable viewpoint for information creation. If the other players accept the proposed issue in the spirit of Spirited Discovery, Reflection and Wise Action, they will start to engage in information creation related to the topic, in addition to sharing in the tacit information and (possibly) environmental scanning that forms the basis of the proposition. This, in turn, allows the participants to discuss existing gaps and problems and to engage in the design game nature of Topaasia® for the purpose of together creating new information potentially able to assist in solving the recognized problems. Wise Action, in many cases, however requires institutional support, which was seen here as largely missing.

6.2. Sensemaking at play

Topaasia® play is a situated sensemaking process. Using the turn-taking fostered by the game rules, players are able to share information about tacit and explicit processes that have affected the organization's past and present and may create new information about its potential futures. They both locate new gaps in the organization's information landscapes (as per Dervin, 1998) and point towards potential courses of action for crossing those gaps. Part of this process comes from sensegiving (see e.g., Gioia & Chittipeddi, 1991; Maitlis & Lawrence, 2007) that takes place during play; as the players debate the merits and importance of different cards' contents for the purpose of selecting the topmost content for further actions, they solve each other's gaps, at least to some extent.

The game is able to disrupt organizational discussion genre expectations because it to a strong extent halts the presence of both hierarchical and cognitive authorities. The game mechanics order the played hand cards to be shuffled on the table before they are discussed, hiding the origin of the viewpoints being suggested for selection. The turn-taking function, in turn, means that everyone gets to state their opinion – and is expected to do so. As a result, even though a manager's or an experienced colleague' inherent authority may be present during a session, its influence on the selection of one of the cards as the most relevant is lessened, even if it is not completely removed. The fact that

the cards may represent drastically different issues that compete for attention is likely to emphasize this, as they refer to domains where the presumed (or actual) expertise of those in formal positions of authority may be far smaller than that of a non-ranking participant working in that area (e.g., sales team members' expertise on dealing with actual clients in person). This guides the joint sensemaking to take to account what might in other circumstances be seen as lesser voices, often even giving them precedence, as was seen in many of the recorded sessions.

This facet arose particularly strongly in the Systems Intelligence analysis. Both non-verbal cues (e.g., Attunement) and verbal support for others' propositions underlined the way in which everyone was treated as a subject expert. The sessions contained exceptionally few negations of others' viewpoints. As noted, parts of this come from the turn-taking, but it appears that the group selection may have led to a sufficient level of initial peer acceptance and flattened hierarchy, creating the framing necessary for dialogues where the discussions were able to concentrate on which of the propositions was the most important or the most suitable for the topic at hand, not whether a proposition was true. This is a remarkable case of Positive Engagement taking place, particularly since the phenomenon could be observed throughout the sessions, and from one group to the next.

From an information studies perspective, this is where it is possible to truly see a difference between the creation of knowledge and the creation of information, which may or not be appended into becoming knowledge. Here, it can be observed how the play sessions allow participants, through the different cards, to discuss what is for the current situation "information" (in the classic sense of the learned content of a message, as discussed by Hartley, 1928, and Shannon & Weaver, 1949) and what is "noise" for that play session, by using an element of human interaction able to make distinctions. The players create the information based on what they already know, either tacitly or explicitly (as per Nonaka & Takeuchi, 1995; Trace, 2007), what they can scan in the environment (as per Choo, 2002), and what they innovate as an emergent property of the play session, forming a "new sense" (as per Vaara & Whittle, 2021) of the situation.

In order for an organization to capture the value of this created information, processes need to be designed for the efficient curation and exploitation of the new information. Power may manifest in sensemaking by at times being episodic and allowing for overt conflict, while it is in other situations continual and systemic, with many properties that are implicitly accepted in the organization (Schildt, Mantere, & Cornelissen, 2020). If the play sessions (or any other type of information collation or creation intervention, for that matter) are treated as separate from the organization's everyday practices and its information processes, the play is rendered useless through structural inertia. One known way to avoid this problem is to ensure also the top management participates in the play, or has play sessions of its own, and knows to appreciate a playful mindset as a strategic tool, instead of saying that they would rather not [waste time on] play. The other alternative is to formally give the play sessions the same information value as other interventions and organizational development sessions, and to ascertain that the organization has the necessary tools and processes for utilizing new information. The optimal combination contains both approaches: a familiarity with the game as a tool and a mindset that appears to create appreciation of its results when played by others in the same organization. Organizations that report successes from using Topaasia®, and keep using it, − obviously seem to have such structures in place.

6.3. Limitations of the study

A limitation of this study is that the researchers did not have access to knowledge on how long each participant had been working in the organization, or what their educational backgrounds were. As a result, some potentially interesting coding possibilities had to be left out, especially in relation to the SI factors Attunement and Systemic Perception. Likewise, the non-disclosure agreements together with the

discussion structure during play make it impractical to describe the information that was being created during play, because without the exact topics of discussion the first-order utterances do not make sense on their own or would be misleading to a reader. It is therefore strongly recommended that future studies using the same or similar tools be conducted in public settings where the rich data can be shared in its entirety.

7. Conclusions

This study has applied a sensemaking approach to understanding how Topaasia®, a design card game, facilitates information creation. By combining turn-taking, a playful mindset, social alibi and recognizable topics, the game enables its players to propose issues that can be developed further in an organization. Topaasia® play functions as an organizational dialogue able to temporarily disrupt the genres in which the organization's sensemaking typically takes place, allowing the players to participate in shared information creation. This is, in itself, not necessarily sufficient, as organizational structures, traditions and discussion genres may prevent the exploitation of the information created during play, with the result that the information is never appropriated into organizational knowledge structures.

Further research should focus on this issue. Since organizational play has been shown to be an effective, possibly even strategically necessary tool for continued success, what kinds of dialogues, scaffolds and structural decisions are needed to gain full advantages from tools such as Topaasia® play? And is the dichotomy between play, often seen as frivolous, and "serious" organizational work, something that in the case of information creation needs to be recognized? Or is it an outdated, archaic misbelief? Only warfare has a longer history of using instrumental games for organizational learning, by way of experimenting with information creation, than business does.

The next key question is therefore in understanding how to best transfer and translate that information into organizational knowledge. To paraphrase Bateson (1972), to make the information a "difference which makes a difference in some later event", and not just emergent data brought up during play, but which is not later utilized as part of value chains of information. Paying attention to the distinctions made during Topaasia® is one such clue. Paying attention to elements from the Systems Intelligence Inventory during play is another. The third part will become available, once it is possible to analyze how, instead of if, the results are taken into actual use in organizations.

Declaration of interests

The authors declare that no conflict of interest exist. This research was conducted in cooperation with Topaasia, but with no influence or limitations by the company on the reported results. Neither of the authors is in any way affiliated with the organization in which the described research took place.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.lisr.2022.101172.

References

Apter, M. J. (2007). *Reversal theory: The dynamics of motivation, emotion and personality* (2nd ed.). Oxford: Oneworld.

Bateson, G. (1972). *Steps to an ecology of mind.* Chicago, IL: University of Chicago Press.

Brandt, E., & Messeter, J. (2004). Facilitating collaboration through design games. In *Proceedings of the eighth conference on Participatory design: Artful integration: Interweaving media, materials and practices – Volume 1* (pp. 121–131). New York, NY: ACM.

Brown, A. D., Colville, I., & Pye, A. (2014). Making sense of sensemaking in organization studies. *Organization Studies, 36*, 265–277.

Buckland, M. (1991). *Information and information systems.* New York, NY: Praeger.

Checkland, P., & Holwell, S. (1998). *Information, systems and information systems: Making sense of the field*. Chichester: Wiley.

Choo, C. W. (2002). *Information management for the intelligent organization: The art of scanning the environment* (3rd. ed.). Medford, NJ: Information Today.

Choo, C. W. (2006). *The knowing organization. How organizations use information to construct meaning, create knowledge and make decisions* (2nd. ed.). New York, NY: Oxford University Press.

Dervin, B. (1998). Sense-making theory and practice: An overview of user interests in knowledge seeking and use. *Journal of Knowledge Management, 2*(2), 36–46.

Deterding, S. (2018). Alibis for adult play: A Goffmanian account of escaping embarrassment in adult play. *Games and Culture, 13*, 260–279.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining gamification. In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9–15). ACM.

Duxbury, S. W. (2018). Information creation on online drug forums: How drug use becomes moral on the margins of science. *Current Sociology, 66*, 431–448.

Eckert, C., Clarkson, J., & Stacey, M. (2001). Information flow in engineering companies: Problems and their causes. In *Proceedings of the 13th International Conference on Engineering Design: Design management – process and information issues (ICED'01), 21–23 Aug 2001, Glasgow, UK* (pp. 43–50). ICED.

Fulton, C. (2017). Urban exploration: Secrecy and information creation and sharing in a hobby context. *Library & Information Science Research, 39*, 189–198.

Galliers, R. D. (2004). Reflections on information systems strategizing. In C. Avgerou, C. Ciborra, & F. Land (Eds.), *Social study of information and communication technology: Innovation, actors, and contexts* (pp. 231–262). Oxford University Press.

Gioia, D. A., & Chittipeddi, K. (1991). Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal, 12*, 433–448.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods, 16*, 15–31.

Goffman, E. (1974). *Frame analysis*. Cambridge, MA: Harvard University Press.

Gorichanaz, T. (2019). Information creation and models of information behavior: Grounding synthesis and further research. *Journal of Librarianship and Information Science, 51*, 998–1006.

Hämäläinen, R. P., Kumpulainen, K.-R., Harviainen, J. T., & Saarinen, E. (2020). Design gaming for learning systems intelligence in socio-emotional systems. *Systems Research and Behavioral Science, 78*, 163–167.

Hannula, O. (2020). *Knowledge co-creation in design games: Conversation analysis of an interorganizational design game session*. Espoo: Aalto University.

Hannula, O., & Harviainen, J. T. (2016). Efficiently inefficient: Service design games as innovation tools. In N. Morelli, A. de Götzen, & F. Grani (Eds.), *Service design geographies: Proceedings of the ServDes 2016 conference, May 24–26, 2016, Copenhagen, Denmark* (pp. 241–252). Linköping: Linköping Electronic Conference Proceedings.

Hannula, O., & Harviainen, J. T. (2018). User perceptions of design games as settings for organizational learning: Case Topaasia cards. In A. Meroni, A. M. Ospina Medina, & B. Villari (Eds.), *Service design proof of concept: Proceedings of the ServDes 2018 conference* (pp. 427–439). Linköping: Linköping Electronic Conference Proceedings.

Hartley, R. V. L. (1928). Transmission of information. *Bell System Technical Journal, 7*, 535–563.

Harviainen, J. T., Vaajakallio, K., & Sproedt, H. (2016). Guest editorial: Service design games as innovation tools, knowledge creators, and simulation/games. *Simulation & Gaming, 47*, 559–565.

Huuskonen, S. (2014). *Recording and use of information in a client information system in child protection work*. Tampere: University of Tampere.

Huvila, I. (2011). The complete information literacy? Unforgetting creation and organization of information. *Journal of Librarianship and Information Science, 43*, 237–245.

Huvila, I. (2022). Making and taking information. *Journal of the Association for Information Science and Technology, 73*, 528–541.

Keys, B., & Wolfe, J. (1990). The role of management games and simulations in education and research. *Journal of Management, 16*, 307–336.

Kinnunen, J., Taskinen, K., & Mäyrä, F. (2020). *Pelaajabarometri 2020: Pelaamista koronan aikaan. [Player barometer 2020: Gaming in the time of corona.]*. Tampere: Tampere University.

Lloyd, A. (2007). Learning to put out the red stuff: Becoming information literate through discursive practice. *The Library Quarterly, 77*, 181–198.

Maitlis, S., & Lawrence, T. B. (2007). Triggers and enablers of sensegiving in organisations. *Academy of Management Journal, 50*, 57–84.

March, J. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71–87.

McKenzie, P. J., Davies, E., & Williams, S. (2014). Information creation and the ideological code of managerialism in the work of keeping track. *Information Research, 19*. paper 614.

Meziani, N., & Cabantous, L. (2020). Acting intuition into sense: How film crews make sense with embodied ways of knowing. *Journal of Management Studies, 57*, 1384–1419.

Nonaka, I. (1987). Toward middle-up-down management: Accelerating information creation. *Sloan Management Review, 29*(3), 9–18.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.

Rossi, P. (2019). Conflicts in leading and managing change: Towards a reflexive practice. In A. Kangas, J. Kujala, A. Heikkinen, A. Lönnqvist, H. Laihonen, & J. Bethwaite (Eds.), *Leading change in a complex world: Transdisciplinary perspectives* (pp. 160–181). Tampere: Tampere University Press.

Salen, K., & Zimmermann, E. (2004). *Rules of play: Game design fundamentals*. Cambridge, MA: MIT Press.

Schildt, H., Mantere, S., & Cornelissen, J. (2020). Power in sensemaking processes. *Organization Studies, 41*, 241–265.

Shannon, C. E., & Weaver, W. (1949). *A mathematical theory of communications*. Urbana: University of Illinois Press.

Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69*, 99–118.

Sonnenwald, D. H. (1995). Contested collaboration: A descriptive model of intergroup communication in information system design. *Information Processing & Management, 31*, 859–877.

Star, S. L. (2010). This is not a boundary object: Reflections on the origin of a concept. *Science, Technology & Human Values, 35*, 601–617.

Törmänen, J., Hämäläinen, R. P., & Saarinen, E. (2016). Systems intelligence inventory. *The Learning Organization, 23*, 218–231.

Törmänen, J., Hämäläinen, R. P., & Saarinen, E. (2021). On the systems intelligence of a learning organization: Introducing a new measure. *Human Resource Development Quarterly*. https://doi.org/10.1002/hrdq.21455. EarlyView.

Trace, C. B. (2007). Information creation and the notion of membership. *Journal of Documentation, 63*, 142–164.

Tsoukas, H. (2009). A dialogical approach to the creation of new knowledge in organizations. *Organization Science, 20*, 941–957.

Tsoukas, H., Patriotta, G., Sutcliffe, K. M., & Maitlis, S. (2020). On the way to Ithaka: Commemorating the 50th anniversary of the publication of Karl E. Weick's the social psychology of organizing. *Journal of Management Studies, 57*, 1315–1530.

Tsuchiya, T., & Tsuchiya, S. (1999). The unique contribution of gaming/simulation: Towards establishment of the discipline. In D. Saunders, & J. Severn (Eds.), *The international simulation & gaming research yearbook: Simulations & games for strategy and policy planning* (pp. 46–57). London: Kogan Page.

Vaajakallio, K. (2012). *Design games as a tool, a mindset and a structure*. Helsinki: Aalto University.

Vaajakallio, K., & Mattelmäki, T. (2014). Design games in codesign: As a tool, a mindset and a structure. *CoDesign, 10*, 63–77.

Vaara, E., & Whittle, A. (2021). Common sense, new sense or non-sense? A critical discursive perspective on power in collective sensemaking. *Journal of Management Studies, 59*, 755–781.

Vesa, M., den Hond, F., & Harviainen, J. T. (2018). On the possibility of a paratelic initiation of organizational wrongdoing. *Journal of Business Ethics, 160*, 1–15.

Vesa, M., & Harviainen, J. T. (2019). Gamification – concepts, consequences and critiques. *Journal of Management Inquiry, 28*, 128–130.

Weick, K. E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.

Weick, K. E. (2003). Enacting an environment: The infrastructure of organizing. In R. Westwood, & S. Clegg (Eds.), *Debating organisation: Point-counterpoint in organization studies* (pp. 184–194). Oxford: Blackwell.

Wilson, P. (1983). *Second-hand knowledge: An inquiry into cognitive authority*. Westport, CT: Greenwood.

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