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The importance of play in organisation

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Chapter 11
The Importance of Play in organisations

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serious games, theories of play, computer play, workplace learning, network-centric organisations

Abstract
The role of play as a ‘social innovation’ is attracting emerging research attention since it can affect the emotional climate and complex collaborative performance of the modern workplace. The psychology of play recognises the benefits of incorporating play and ‘playing games’ at work. The increasing use of computer games throughout our society motivates the use of games and game technology for serious purposes including education, training and research. While managers are often reluctant to publicly state that play is good for work, they are willing to use the term ‘Serious Games’. These are games that engage users in their pursuit, and contribute to the achievement of a defined purpose other than pure entertainment. This paper presents a study into the use of online team-based gaming to explore the cooperative and social aspects of team behaviour in a department of an organisation that wished to increase its human network-centric capability. A session of an online version of the traditional board game Go was conducted and a range of data was collected, leading to a qualitative analysis of the game and its impact on the players. The results indicate that team gaming sessions can enhance people’s awareness and mastery of the collective processes underlying teamwork and cooperation in the workplace. This contributes to our understanding of the use of play and gaming in the workplace as a social innovation.

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Introduction
Although usually associated with the young, play is an engaging, fun and safe means to explore and experiment with the unknown for people of all ages (Mainemelis & Ronson 2006; Leigh & Kinder 1999). The psychology of play recognises the benefits of using play and games at work (Leigh & Kinder 1999; Statler, Johan & Bartvictor 2009; Harris & Daley 2008). However, there appear to be under-appreciated advantages in using play and games for staff development in
work organisations. Researchers and managers are reluctant to use terms such as ‘play’ in the work context because traditionally it is seen as an activity which is opposite to work. Nevertheless, there is a growing interest in what is called ‘serious games’ to improve morale, cognitive and social learning, and cooperative behaviours in organisations.

Emerging research attention is being paid to ‘serious games’ and to the role of play in improving the emotional climate and collaborative performance of the network-centric workplace (Crawford et al. 2008). The increasing use of computer games throughout our society motivates the use of games and game technology for more serious purposes including education and training. The term ‘serious games’ has been used to describe games that contribute to the achievement of a defined purpose as opposed to games that provide pure entertainment only (whether the user is consciously aware of it or not).

The authors of this paper and other colleagues have investigated the use of gaming to study the human aspects of networked teams and to develop a means of increasing social network-centric capability in the context of the Australia military (see Hasan & Warne 2008). An online, team version of the traditional board game Go, named Go*Team, was built for this research and protocols for play sessions have been developed. Traditionally in Go, two opponents take turns to place black and white stones on a grid, aiming to capture territory as well as to surround and capture the stones of the opponent. Like Go, Go*Team calls upon and enhances strategic problem-solving skills of individual competitors. Additionally, Go*Team also invokes social coordination skills, since as teams of players collaborate to win the game in the exploratory and non-threatening environment of ‘play’; they must learn to cooperate in online collective decision-making under variable and uncertain conditions. The question we now ask is: how can this Go*Team environment be incorporated into training sessions for workers enabling pleasant but serious learning toward a more cooperative network-centric culture?

This paper reports on a study of the use of Go*Team for building team cooperation in an organisational setting. The objective of this qualitative study was to explore the ways that Go*Team sessions, through the mechanism of play, could enhance people’s awareness and mastery of the collective processes underlying teamwork and cooperation in the context of the modern workplace.

**Literature Review**

This literature review adopts a cross-disciplinary approach that spans the disciplines of psychology, education, organisational behaviour and information systems. It aims to synthesise three concepts, namely: the power of developmental play in socio-emotional development; the benefits of computer-supported games for learning and work; and the potential of the use of play for development and learning in network-centric work environments.

**Developmental Play and Socialisation**

Play is widely accepted as a powerful medium for the development of imagination and socialisation over the entire life span (Csikszentmihalyi 1990; Rieber 1996; Goncu & Perone 2005). However, play is most notably associated with children with the result that so much of our understanding of play comes from studies of the young. Play is not only an enjoyable activity of children but it contributes significantly to children’s development (Vygotsky 1967; Sutton-Smith
Theories of play have identified many ways in which play may advance children’s cognitive, social and emotional development (Piaget 1952; Vygotsky 1978; Sutton-Smith 1997). In play, children acquire the foundations of self-reflection and abstract thinking, develop complex communication and meta-communication skills, learn to manage their emotions and explore the roles and rules of functioning in adult society (summarised in Verenikina, Harris & Lysaght 2004).

Developmental play allows for the growth of children’s awareness of the world, and the world of social relationships in particular (Vygotsky 1978). By playing out various social situations, children form and expand their mental representations and abstract images of the ways that the world operates. In play, children are often seen to take on the roles of others in their real lives – such as mother, father, baby, teacher and friend. By playing out such characters they exercise, and reflect upon, different manners, ways of behaviour and styles of talking, thus developing self-reflection in communication, or meta-communication, and the awareness of rules and strategies in social relationships (Bateson 1976). Additionally, play is an important tool for children’s emotional development (Vygotsky 1978). Psychoanalytic perspectives explain the value of play in allowing children to express negative emotions in a safe environment (Erikson 1963, in Verenikina et al. 2004).

Although less extensive than research into the impact of play for children’s development, adult learners’ play and its effect on their socio-emotional world have also been explored (Göncu & Perone 2005; Harris & Daley 2008; Holzman 2009). It has been demonstrated that carefully orchestrated play in organisations contributes to “building adult learning communities” and enhances “adult learners’ collective experiences and understandings” (Harris & Daley 2008, p. 52).

**Play and Computer Games**

The emergence of new forms of digital media has stimulated a fast growth of a wide variety of computer and video games which are seen by educational researchers as a new form of play. Salonius-Pasternak and Gelfond (2005, p. 6) describe computer play as “the first qualitatively different form of play that has been introduced in at least several hundred years.” They suggest that it deserves a thorough exploration of its affordances in children’s development. Numerous studies have been conducted to demonstrate the value of computer games in children’s development (summarised in Verenikina et al. 2008). Interestingly, research in computer play has expanded well beyond the development of young children with an increased number of studies now examining adult learners (Wilson et al. 2009). In view of the rapid development of new technological media in educational and work organisations, researchers suggest that we reconsider the role of ‘serious play’ across all ages of players and “revisit the almost alarmingly simple, yet powerful construct of play” (Reiber 1996, p. 43).

**Play in Organisations**

The increased complexity of modern organisations demands an advanced ability to work in numerous teams where people and groups have to communicate, cooperate and share information to achieve organisational goals. In a technologically-enhanced organisation, more often than not, daily routine communication of teams is conducted in a computer-mediated environment, both online and off-line. This requires all team members to be able to communicate
in an efficient and productive manner. Current literature emphasises a “science of human relationships” (Goleman 2006) which implies adequate training for the staff in an organisation. The use of computer play has a strong potential to enhance the social relationships and emotional climate in organisations.

While the benefits of fun and play at work have been studied for a number of years (Gropper & Kleiner 1992), the growing complexity of modern organisations has stimulated an increased interest in play that decreases stress and stimulates positive change (Dreyer 2007). Recent research sees play as an inextricable part of the management of strategic innovation in organisations (Dodgson, Gann & Salter 2005). Considering ‘serious play’ in organisations suggests that play in the workplace can have significant benefits regarding strategic innovation, the management of uncertainty and continuous learning (Statler, Johan & Bartvictor 2009). Mainemelis and Ronson (2006) have specified the role that play has as both a form of engagement and as a form of diversion from work – both of which promote creativity in organisations. A distinction between games and simulations has been discussed – while simulations aim to accurately represent a task or a particular environment, games are “an artificially constructed, competitive activity with a specific goal, a set of rules and constraints” (Hays 2005, p. 15, cited in Wilson et al. 2009, p. 219). Summarising a number of studies, Wilson et al. conclude that “the use of games for learning leads to improved general learning, increased motivation, and improved performance” (2009, p. 219), however, “[m]any areas of research remain unexplored” (Wilson et al. 2009, p.220).

Lessons that can be learnt through play concerning teamwork and cooperation are particularly valuable as organisations become less hierarchical and more networked in their configuration (Huang, Ceroni & Nof 2000; Sambamurthy et al. 2003). The connotation of network-centrism continues to expand as ICT networks and applications transform the ways in which people gather, share, and process information and knowledge and, consequently, transform the ways in which they make decisions to act (Pascoe & Ali 2006; Warne, Hasan, & Hart 2006).

The network-centric paradigm allows organisations to change their culture from one determined solely by a command and control, rule-based hierarchy to one which supports more dispersed decision-making through the sharing of information and knowledge (Friel 2002; Crawford et al. 2008). Within the network-centric paradigm innovative working is encouraged via self-directed teams. This requires the human attributes of diversity, cooperation, loyalty, trust, sharing information and knowledge, collective decision-making and action, common goals and the support of social technologies (Daft & Lewin 1993; Warne et al. 2004). Internet-based social networking has become widespread in society, particularly amongst the young, and the social technologies that support networking are gradually finding a place in work organisations. In posing the question for this research, we are suggesting that preparing workers for this new less formal and democratic workplace is a social innovation challenge that can be met through play.

As mentioned in the Introduction, the study described here uses a purpose-built online team game, Go*Team (Hart et al. 2006). It is based on the board game Go, which has been instrumental in improving strategic capability in players for centuries. The Go*Team game provides a variable, challenging environment that requires players to exchange information and act cooperatively to perform well on a competitive task. The Go*Team software facilitated data
collection on many team and individual factors such as shared situational awareness (Hasan et al 2007a), cooperative team behaviour (Hasan et al 2007b), network-centric organisation (Warne & Hasan 2007) and diversity in teams (Crawford & Hasan 2009).

As games were played in the previous research with Go*Team, the significance of the play element of the game emerged in the way that players became engaged in the team activity and enjoyed the experience. Participants could freely explore many aspects of a realistic, general problem-solving environment and could make mistakes without being criticised or punished. While the different aspects of Go*Team have been previously studied in the context of play for entertainment this was the first time that Go*Team was formally used for workplace training.

Methodology

Aim and Research Questions

This study aimed to explore the potential of the Go*Team game to enhance the cooperative aspects of team behaviour in a department of a modern organisation for workplace training. Two research questions guided the study: (i) what lessons can be learnt from the gaming practice concerning teamwork and cooperation in an organisation? and (ii) what are the ways that the Go*Team game session can affect the social awareness of its workplace participants?

Overview of the Method

The research describes a one hour session of playing the Go*Team game by participants in a team-building session conducted in the workplace with administrative staff at a university. All the stages of the play were documented and the following data were collected: the protocol of the play; communication between participants during the play; the pre-brief and debrief discussions (a detailed description of the procedures and data collection is provided below). During the session two researchers were present: one conducted the session and the other acted as a non-participant observer, with no interaction with the participants (Creswell 2003). The data were qualitatively analysed to answer the research questions.

The Go*Team Game

As described in the Introduction, the Go*Team software application (see Figure 1) is a purpose-built online, team version of the ancient Chinese board game Go, which has been popular as a strategy game for centuries and so has stood the test of time as to its popularity and enduring challenge to players.
Figure 1. The boards of two players on the White team showing different sets of stones visible to each player and positions of non-visible stones (marked with the small letters) from information sent by other team members.

The Go*Team game’s suitability for this research lies in its resemblance to the computer-mediated nature of joint activities within a modern university organisation which are characterised by a degree of uncertainty and a necessity of constant information sharing to achieve desirable outcomes. Additionally, the basic rules of the game are quite simple to learn.

The Go*Team game includes two teams (one playing black stones and one playing white stones). Each team has several players, each playing at a computer either individually or in pairs. The aim of the game is to place black and white stones on a shared grid (which each player can see only partially on their screens) in order to occupy territory as well as to surround and capture the stones of the opponent. Team members are not able to see each other’s screens, since these give different views of the game, imposing the need to communicate (which can be done via different media). Players may use markers to improve their situational awareness in the game. Team members must communicate their moves and observed changes to their view of the board through online CHAT. The protocol of the sequence of the play is captured by the program. The software operates over a network in client-server mode. The facilitator (researcher) has a wide range of options to control the game settings from the server computer and each participant’s play on a client computer. To perform well in Go*Team the players need to cooperate and coordinate their efforts, as well as share information for timely and appropriate decision-making. On the other hand, they also need to engage in competition, which provides challenge and motivation.

Participants and Location
The team-leader of a University administrative unit, who wished to improve inter-department collaboration among her staff, expressed an interest in trialling the ‘serious game’. She thus acted as a real client and the Go*Team session was planned with her to choose teams from amongst her staff that included ten participants (five on each team) from different departments. The chosen participants included 8 females and 2 males, all of approximately 30-50 years of age. The session was located in a suitable room within the university. At her request, a report was produced that included profiles of the performance and debriefing comments for each player. These have been produced and were shown to her at a review meeting. Her response gave a valuable indication of Go*Team as a mechanism for both training and profiling participants.
Procedures and Data Collection Methods
The participants were informed that Go*Team would allow them to explore, in a playful way, how they function in the team environment and, afterwards, to reflect on the techniques that are more successful and the barriers that inhibit them from operating effectively as a team. Each player had his or her own computer on the network. Since in Go*Team players can only see the stones they play themselves and those of the opposition team near these (see Figure 1), the players had to communicate their screen view to other team members who could use markers to record the position of the stones that they could not see. Communication though computer CHAT was thus vital to all players in order to have a correct view of the state of play.

The sequential procedure for the session and corresponding data collection methods included:
- Pre-brief open discussion: data were collected on experiences of participants as members of teams and attitudes to working in teams (observations and notes taken).
- An Introduction to Go*Team play; and a short trial game.
- A ten minute face-to-face team meeting where players could get to know each other, and discuss strategies and tactics.
- Play Go*Team for 1 hour collecting data on individual and team plays, and their communication. The following numerical data were recorded by the system for each participant: the number of stones played; the number of messages sent; and the number of correct and incorrect markers used. These data provided an overview of different levels of participation and understanding by players at different stages of the game. Observational notes were taken with particular attention to the dynamics of participants’ behaviour and episodes of oral communication.
- Debrief focus group: descriptive data were collected from a reflection on the challenges faced, enjoyment, sharing information, team cooperation and lessons learnt. Software was used which kept a record of the reflections expressed by the players in response to the questions entered in the system prior to the session. The questions for debrief were as follows: How much did you enjoy playing Go*Team? How competitive did you feel while playing? How difficult was it to communicate while playing? How well did your team go? How well did your team cooperate? Was anyone the leader? Did you decide that or did it just happen? What did playing Go*Team tell you about working in teams?

The data were also collected from a follow up meeting with the client. This was particularly relevant to the use of Go*Team as a corporate team training tool.

Results
The data that were collected from the recording of the play process, the communication records, the pre-brief and debrief of the session, and the observations and follow up meeting with the client were analysed (as described below) in relation to the research questions. The presentation of the results includes the element of play as a core construct.

The Level of Engagement in Play
The dynamics of the actual play of the game, which demonstrated both team and individual performance, is presented in Table 1, which shows the number of stones played by each player, the number of CHAT messages sent, and the number of correctly marked stones as an indication of their awareness of the position of the stones on the game board.
The overall amount of the stones played and the messages sent by the participants (Table 1) indicated a high level of involvement of all the participants in the game process, which is consistent with the observational notes. During the session all the participants were actively involved either in playing or writing messages, looking at the screen, or talking through what was happening on the screen. They were exchanging text messages trying to figure out the turns or to simply encourage each other. Some participants demonstrated a higher level of participation in play and communication than others (reflected in the number of stones and messages in Table 1). For example, Player “White 2” during the hour of play sent 81 messages and played 33 stones! Other participants demonstrated lower numbers, for example, player “White 5” played only 4 stones and sent 19 messages. The domination of one particular player was noticed by some participants in the debrief. Further analysis of individual cases could have been conducted, however, it was not within the aim of this paper.

The Client’s Perspective
The client wanted a summary of the behaviour and learning for each of the participants and so the data from Table 1 were broken down for each player, and their comments from the debrief pulled out into individual reports. For example: White 1, Stones Played = 8; Messages Sent = 32; Correct Markers = 55, followed by her responses to questions in the debrief (not shown here). As the client knew most of the players well she commented on the aspects of their personalities that came out in these reports. For example, it surprised her how subdued the 2 male players were but not that White 2 took charge of her team. Her main observation was how much she learnt from this activity which only lasted for three hours.

The tables and graphs of the overall play were also discussed with the client. The client was interested to explore the patterns of play over the game time. For example, the white team played more stones than the black team but sent far less and briefer messages (“more action, less talk”). Each team thus developed its own style of communication and play: the white team was more matter of fact with White 2 as the leader while the black team was much more expressive and volatile. Investigating the distribution of these data over the period of the game showed a variety of individual approaches. Showing a graph of these to the client made her comment that she could see elements of different personalities in the patterns of play. Some were consistent, others sporadic, some quiet, some lost interest etc.

Communication, Meta-communication and Play
The analysis of recorded communication allowed the identification of four major types of task-related messages: 1) informative; 2) strategic; 3) commentary; and 4) social. The first type included the exchange of information on the position and movement of the stones (e.g. ‘black

<table>
<thead>
<tr>
<th>Number of activities recorded</th>
<th>Black 1</th>
<th>Black 2</th>
<th>Black 3</th>
<th>Black 4</th>
<th>Black 5</th>
<th>All Black</th>
<th>White 1</th>
<th>White 2</th>
<th>White 3</th>
<th>White 4</th>
<th>White 5</th>
<th>All White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plays</td>
<td>14</td>
<td>12</td>
<td>3</td>
<td>14</td>
<td>10</td>
<td>53</td>
<td>8</td>
<td>33</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>65</td>
</tr>
<tr>
<td>Messages</td>
<td>74</td>
<td>54</td>
<td>54</td>
<td>55</td>
<td>98</td>
<td>335</td>
<td>32</td>
<td>81</td>
<td>33</td>
<td>24</td>
<td>19</td>
<td>189</td>
</tr>
<tr>
<td>Correct Markers</td>
<td>85</td>
<td>41</td>
<td>67</td>
<td>20</td>
<td>74</td>
<td>287</td>
<td>55</td>
<td>95</td>
<td>75</td>
<td>77</td>
<td>84</td>
<td>386</td>
</tr>
</tbody>
</table>
stone E12’, ‘what is on a16?’). Both the teams produced an approximately equal amount of such messages. ‘Strategic’ messages included exchanges on the strategies of moving the stones, distribution of responsibilities and taking turns (e.g. ‘next move needs to be E12... quick!’; ‘S. and R. – try and surround G9’). One team (Black) produced significantly more strategic messages than the other team. The ‘Commentary’ messages included comments on, and verbalisations of, actions and emotions (e.g. ‘I'm a little confused’, ‘woops sorry, getting over excited’ etc.). The fourth type of message, ‘Social’, included a variety of messages which did not contain any specific information but which had social purposes such as supporting, encouraging (e.g. ‘Well done’, ‘Go R’) or enhancing communication (e.g. ‘Is everyone getting my messages?’).

Some social comments (mostly in the team with black stones), indicated that the participants actually engaged in a make-believe play! They pretended the game was a ‘war’ and that the opposite team was the ‘enemy’ (e.g. ‘now we're at WAR!!’, ‘Battle stations’, ‘Always put enemy before we talk about white dots’, ‘what enemy are we going to attack?’). Such engagement in make-believe allowed for a number of ‘meta-communication’ episodes (Bateson 1976) which indicated that the participants reflected on the styles of their communication (e.g. ‘attacking seems easier than defending’, ‘are we still on the defence?’).

Overall, the need to work together and share information stimulated an intensive task-related communication thus making communication a focus of attention and further reflection. In the debrief the participants commented extensively on the characteristics of such communication. One participant wrote:

Well, according to some team members we had a 'Hitler' like leader. I personally think it was a little more structured like a communist community ... we had players that were 'naturally' more aggressive and assertive I think...

All participants in the debrief commented on a variety of strategies that they used. Some felt that overall their strategic communication was well-organised and productive. This was mostly true for the team which had more strategic rather than simply informative messages (Black). On the contrary, the members of the other team noticed that it was hard to communicate, as often the information that was sent was unclear and it was hard to keep track of the turns. All the participants commented that not everyone had enough opportunity to move stones. This led us to assume that the difficulty of collaborating effectively online through CHAT under time pressure was partly due to the fact that there were five people per team. In previous research the largest teams used were teams of four which proved easier to coordinate for the members of the teams. Nevertheless, everyone commented that the play part of the game was fun.

Interestingly, it took some time for the participants to take the session as play. At the beginning of the session (pre-brief and pre-game team meetings) participants were cautious and approached the session as part of their job and it was taken by them much more seriously than by the participants of some other research sessions, which were previously conducted outside of a work context. They asked for a work-related purpose to be explained to them at the outset and they appeared to be hesitant to engage in play where they could explore options and take risks. They wanted to know how they would be assessed in order to perform well at a specific task.
The gap that exists between the typical ‘ordered' workplace culture and that of the network-centric paradigm was evident in the team meetings before the game where some players made comments such as “we needed to discuss the team strategy prior to playing and assign team roles”, reflecting a traditional work culture. The participants did, however, admit that there was a need to improve cooperative behaviour in their workplace and they were enthusiastic about the potential of games such as Go*Team for this purpose.

The recorded data from debrief discussions provided us with a set of insights into the session. Some of the most significant observations, patterns of behaviour and expressed views of the participants were as follows.

- People enjoyed the game itself, which was evident through much of the content of the CHATs and the light-hearted exchange between players on both teams during the debrief session. Obviously, some ‘social capital’ was generated among the group as a whole and between staff from different departments who did not know each other.

- When reflecting in the debrief on what happened during the game participants made observations on their own behaviour and that of others, saying that they learnt something about themselves as much as about their team-mates and the opposition. One player remarked that it was “interesting to see how everyone played”. Another noted the challenges of teamwork saying that is was “hard to keep up with all the info being sent and given”.

- Numerous comments indicated that the session allowed for reflection on the teamwork, e.g. “winning is fun, but winning as a team is MORE FUN”, “we didn't really have a leader but a couple of members were definitely more dominant and we won anyway”, “it was nice to be able to have a laugh with people away from the normal work environment”.

- Neither the players nor the client (the team-leader of the administration staff) felt that spending a couple of hours having fun at work was a waste of time when it ended in harmony and the strengthening of interpersonal relationships.

Discussion and Conclusion

In this research we studied how the online gaming environment provided by Go*Team could be incorporated into training sessions for enabling staff learning towards a more cooperative culture in the workplace. Both the participants and the client confirmed that the use of the online Go*Team game in the session as described in this paper produced its desired outcome, namely an improvement in inter-department collaboration among the staff involved. At the client’s request, teams were deliberately formed to mix staff from different departments and this resulted in positive social interactions across departmental boundaries that have carried over into the workplace.

Our first research question asked: what lessons can be learnt from the gaming practice? In answering this question the results of the Go*Team session with university administrative staff provided a number of insights. Meeting with the client before the game enabled us to understand her objective. The flexibility in setting up the game made it easy to align the Go*Team session with this objective. In this case, mixing up the players on each team readily achieved the desired outcome to improve inter-department collaboration. We observed, however, that many other lessons were learnt both by the players and also by us as the researchers. Playing the game was challenging but enjoyable, particularly the fun of cooperating with others. The environment was
non-threatening as it was not seen as a work task but there was a sense of joint accomplishment, for example when an opposition stone was captured.

In summary, this study illustrates the value of leveraging concepts of play as an innovative way to prepare workers for complex activities in self-directed cooperative teams as required in the modern workplace.

In particular, computer games are increasingly used for entertainment throughout our society with people playing on the bus, at home and at work. Computer games thus affect more and more people and areas in today’s society. This trend motivates the use of games and game technology as a workplace innovation for more serious purposes, e.g. education, training, profiling or organisational change management.

Organisational functions such as knowledge management (KM) and human resource management (HRM) have much to gain from play as they deal more directly with issues that arise out of human activity and collaborative work practices. Play provides opportunities for activities that are valued in HRM, especially change management, collaborative work practices, education and training. Play can be used to explore the multiple forces that motivate employee behaviour and also to act as an innovative change agent that leverages the current social climate. Play provides a mechanism where change can be achieved at a lower risk to the individual and where the driving forces are reframed in the context of the play. These drivers may be seen as externally shaped by circumstances outside the agent's control, such as the state of society or the seasons, or they can be internally motivated from a conscious desire to make specific changes.

The outcomes of this project are both practical and theoretical. The theoretical implications of the project are that it establishes ways that ‘serious play’ can be used to enhance social innovation in organisations and increase our understanding of the benefits in establishing a new approach to organisational learning based on play. The Go*Team game created a situation where communication became the centre of attention which allowed the participants to reflect on the strategies and characteristics of such communication in a non-threatening and playful way.

In practical terms, the cultural shift needed for a traditional organisation to be more network-centric is rarely achieved easily, and gaming sessions, such as the one with Go*Team, may have a role to play. Even if it is recognised that an organisation and its people need to change, managers are often at a loss as to what to do. The potential of Go*Team as a workplace, team-building mechanism, is demonstrated in the project reported here and it would be relatively easy and inexpensive to implement.

The way each member of an organisation behaves in Go*Team sessions may also provide a means of classifying how prepared they are to operate in an uncertain network-centric environment where decision-making is decentralised in self-directed teams and critical actions must be undertaken with partial information under time pressures.
Further research
Activities based on games have the potential for learning capabilities such as cooperative behaviour which are otherwise difficult to develop in the workplace. Each Go*Team session provides a rich setting in which such activities can be conducted and studied through observation and analysis. It thus lends itself to future research by collecting data from new instances of playing the game in different settings and under different circumstances. Future research will also involve greater quantitative analysis of the data that we have already collected, enriching the time series data with coding of the messages sent during the game. This will enable us to analyse individual and team performance across the dimensions of communication, behaviour and performance. The research lessons learnt from this innovative use of the game could be used to build a multidisciplinary theoretical framework that can be tested with further Go*Team sessions.

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