Game Mastering a Pervasive Larp – Experiences from *Momentum*

Staffan Jonsson  
Interactive Institute  
Box 1196  
SE 164 26 Kista  
staffanj@sics.se

Annika Waern  
SICS  
Box 1263,  
SE 164 29 Kista  
Sweden  
anника@sics.se

Markus Montola  
University of Tampere  
Kanslerinrinne,  
FIN-33014, Tampere,  
Finland  
markus.montola@uta.fi

Jaakko Stenros  
University of Tampere  
Kanslerinrinne,  
FIN-33014, Tampere,  
Finland  
jaakko.stenros@uta.fi

**ABSTRACT**
Runtime Game Mastering is a powerful tool in steering a pervasive game according to an artistic vision, while yet it enables ample opportunities for participant improvisation and initiative. A game mastered game can be collaboratively created by the designers and the participants.

In this article, we discuss how game mastering was realized in *Momentum*; a pervasive Larp which seamlessly blended reality and fiction into a consistent and coherent whole. We discuss a number of techniques that were used and how they influenced the game.

**Keywords**
game mastering, larp, role-playing, pervasive games, technology-supported games, ubiquitous computing

**INTRODUCTION**
Games that include a game master form an interesting category. Compared to computerized games, introducing a game master adds flexibility to the game: the game master can adapt the game content and rules to fit participant activities and changing environments. Compared to freely running games such as traditional live-action role-playing (larp), adding a game master makes it easier to control the pace of the game, steer storylines, and maintain a consistent aesthetic vision for the game. The game master function is particularly important for pervasive games; games that take place in the real world and intermix with participant’s everyday life [13, 14].

Game mastering allows dynamic and responsive storytelling in the game. Structurally, game mastering is a compromise between games that are fully controlled and automated, and games which only provide a ‘playground’ in which participants organize their play through a social contract. It inherits advantages from both. For example, game mastered games make it possible to re-use participant generated content by introducing it into the main storyline of the game, something that is near impossible to accomplish with fully automated games. At the same time, game master intervention makes it possible to control the content and the storyline to maintain the artistic qualities of the game, something that is very hard to achieve in a ‘playground’-style of larp. Finally, through reformulating the hidden rules of the game, a game-master is able to pace the game, making it simpler or harder to play under different conditions and for different participants. Implementing this is near impossible in both automated games and socially constructed playground games.

**BACKGROUND**
The game master is a functional role in a game which is tightly integrated into the game mechanisms but separated from being a participant [6]. A game master maintains control over the game flow by distributing critical information at the right times, acting as a referee in conflict situations, and replanning critical functions of the game. In many games the game master also maintains the game world as such.

The term was originally coined for tabletop role playing games, which took the role of the referee used in wargames and expanded it to simulating the whole game world and maintaining the storyline and the content [10]. In table-top role playing, the game and game state is typically represented as much in the head of the game master as in any other form. The game master is in strong control over the game progress as all game play is situated around a table to the extent that the game master has a fairly good perception of participant thoughts and hidden activities. The converse is not true, however: the ‘chief trick’ of a tabletop game master is to hide information from the participants, or distribute it unevenly among the participant group. It is not uncommon for game masters to decide the outcome of a battle quite independent on how the dices roll, since they had a particular plot line in mind.

**Game Mastering in Pervasive Games**
Game mastering has proven invaluable in Pervasive Games, even when these are implemented with computer technology. The real world is a fickle stage for games: its
conditions are infinitely variable and rich, and provides an unlimited resource for participant improvisations.

In order to succeed in game mastering, four components need to be in place. The game requires a sensory system providing information for decision making, and the decisions need to be actuated to steer the game. Finally, a communication structure is needed. In a tabletop role-playing game the live game master (GM) present can fill all the four functions, but in larp and pervasive games this is different. Technology mediation will take on several of the functions and since full technology mediation is not possible, pervasive games will typically not be fully game mastered. Instead, they can both be partially automated and partially socially constructed by the participants on their own.

Games, such as Uncle Roy All Around You and Can You See Me Now [2,3,4], have made limited usage of a game master to adapt the game to technical infrastructure requirements. For example, in Can You See Me Now the game managers maintained an overview of the WLAN and GPS coverage of the play area and adapted the locations of players and content to those conditions.

Game mastering can also include active authoring of content to fit the activities of the participants. In the cellphone role-playing game Day of the Figurines ¹ [1], the game masters would manually respond to sms messages by the players, sometimes by following a pre-scripted story line, and some times by adding entirely new content. The game master role was in this game shared between the operators, who implemented basic participant activities and responded to participant queries, and the author who was called in to implement story line changes, when player messages took the game in an unexpected direction.

A particularly interesting example of game mastering in pervasive games is the ‘puppet master’ role used in alternate reality games (ARG) [12]. Alternate reality games rely on a seamless ‘this is not a game’ aesthetics, the game may for example appear to reveal a hidden conspiracy or secret organisation. In an ARG, the puppet masters are typically also the game designers, as a large part of the content authoring takes place while the game is running. Due to the seamless merging of reality and fiction that ARG rely on, the puppet masters stay hidden throughout the game; a game that is “not a game” [11, 17] cannot have a visible game master. This seamlessness requirement of ARG pose large difficulties for game mastering, as the ARG puppet master has very little information about what the participants are actually doing.

---

¹ This discussion refers primarily to the first trial version of Day of the Figurines. In its final version, the game play is automated to a much larger extent and content is typically edited only between game trials.

---

Game Mastering Larp

ARGs and Larp share the problem that they are much more difficult to game master than tabletop role-playing games. As the participants are not situated around a table, both sensing and actuation are difficult. To add, more immersive larp cultures such as the Nordic larp tradition do not approve of visible game masters. These cultures have instead preferred a game style where the game designers ‘set the scene’ for the play: once the game is ongoing it can go in any direction depending on participant improvisations. Such larps form a playground rather than a designed experience, and are extremely hard to predict [5].

One approach to game-mastering in larp has been to introduce a hidden game master, akin to the puppet master in ARGs. This approach has been tried e.g. in Carolus Rex [8], a larp played out in a strictly confined area and where game mastering was achieved through surveillance equipment and an in-game communication channel. The game story was that it took place inside a space ship travelling through space; its physical setting was inside an old submarine. Only through communicating with the ship’s AI system, the participants could get a picture of the world outside the ship and obtain crucial information about the story line and the other characters. This AI was in reality played by the game masters on distance, who through this arrangement were able to both survey the game and influence its direction. The technology to implement this system was an internet-based chat system with the game masters, serving both as the sensing (when participants were typing) and actuating system (as the messages from the AI directly influenced the gameplay), as well as the communication structure.

Although this approach was successful in Carolus Rex, it severely restricts the freedom of participants to move around and also puts game masters under extreme working conditions. In Carolus Rex, the game masters were on duty for 56 hours straight, with little opportunity to share the activity between game masters.

A similar but mobile setup was used in Prosopopeia Bardo 1: Där vi föll [7], the first production in the Prosopopeia series. In this production, a tape recorder from the seventies was used to implement a communication channel with ‘ghosts’ played by the game masters in much the same way as the chat system in Carolus Rex. Technically, the setup was implemented through a mobile phone built into the tape recorder. This setup allowed participants to be mobile (the tape recorder was at least draggable), and the game was effectively played all over Stockholm.
The follow-up to *Där vi föll*, *Prosopopeia Bardo 2: Momentum* [15, 16] was produced as an experiment in taking a heavily game mastered larp out of the closed room and onto the streets of a city. The larps in the *Prosopopeia* series are ghost stories where the spirits of the dead return to this world by possessing a set of willing persons, the ‘vessels’; these are the participants.

Both *Där vi föll* and *Momentum* are designed as pervasive larps using ARG aesthetics. The central instruction to the participants is ‘play as if it was real’; throughout the game the participants play both themselves believing that it is possible to be possessed by a ghost, and the ghost itself. *Momentum* blended seamlessly into the participant’s everyday life: the game was on continuously for 36 days, mixing intense playing periods (when the participants spent most of their time in the central game location or on quests in the real world) with low intensity periods when the participants continued to live their normal lives. The participants could, at any time choose to play the game – or the game could interfere with their life by contact from the ghosts or by other participants.

**GAME MASTERING TECHNIQUES**

Where *Där vi föll* had been limited to a small number (twelve) of participants and required intense game mastering over the entire duration, *Momentum* aimed for both a higher number of participants (30) and a much longer duration (36 days). This meant that a great emphasis was placed on creating well-functioning support for the game master role.

The tasks and problems involved with setting up game master technology is to some extent similar to that of setting up wizard of oz environments for ubiquitous and pervasive applications [9], even though the objective is different. To enable game mastering in *Momentum*, a vast variety of techniques were used.

**Technology for Surveillance and Communication**

In the *Prosopopeia* series, communication between the lands of the dead and the living is central. The ghosts stay in contact with their homeland through techno-magical artifacts built to resemble mythical EVP equipment for ghost communication.

The *Där vi föll* EVP machine had been a movable reel-to-reel tape recorder. It was completely redesigned for *Momentum*, where it instead was implemented as a fixed installation in the participants’ headquarters. Furthermore, it was redesigned to replay pre-recorded messages rather than direct communication with the game masters. To locate a recording, the participants had to scan a virtual ‘frequency band’. This turned the EVP machine from a pure communication channel into a puzzle. This way, the game masters could set up information for the participants in advance and not need to be on constant standby.

More direct communication was also used, in particular through a ‘ghost chat’ which implemented a distorted text link to the world beyond – all messages received this way were garbled and often in foreign languages. A very old matrix printer complemented the setup and was used to relay particularly important messages for saving.

Surveillance technology was also rigged in the participants’ headquarters - staged in an abandoned nuclear reactor below Stockholm.

---

2 See also the post-production documentation site [www.prosopopeia.org](http://www.prosopopeia.org) (referenced March 2007).

3 Electronic Voice Phenomena, occult phenomena, by the believers described as communicating with the other side by the use of technical equipment.
of the game developments to the game masters.

engagement and creativity, while leaving the final control to the game masters. This approach provides room for participant progression, and depending on the game’s overall messages in the EVP machine were entered manually by neither of the installations was completely automatic. The need for continuous game mastering. At the same time, both the EVP machine and the game masters say on whether a group managed to cleanse a magical spot. Aesthetic evaluation, the game masters would have the final say on whether a group managed to cleanse a magical spot.

The Node Game

*Momentum* included a semi-automatic subgame (*the node game*) that ran without continuous game master involvement. The game masters had selected a set of locations around Stockholm with an interesting history (such as a slaughterhouse, the murder scene of a prime minister, the U.S. embassy). These were tracked down by using GPS and marked by hidden RFID tags. Through various clues and using special equipment the participants could locate these places, learn their historical significance (illustrated by soundtrack played when the participant came in the vicinity), and then locate the exact spot (RFID tag) that needed to be 'cleansed’ by magical means. Towards the end of the period, the participants were split up into four teams that would compete in finding and cleansing as many as possible of these places.

To clean a magic spot the participants had to design and perform a magic ritual designed to fit the place’s history. Although the search for nodes was automated, the rituals were not. The technology was able to detect that a ritual was performed but not how well it was performed. They were improvised by the participants and reported back to the game masters by controllers (see below). Based on aesthetic evaluation, the game masters would have the final say on whether a group managed to cleanse a magical spot.

Both the EVP machine and the node game thus lowered the need for continuous game mastering. At the same time, none of the installations was completely automatic. The messages in the EVP machine were entered manually by the game masters depending on the game’s overall progression, and rituals were manually refereed by the game masters. This approach provides room for participant engagement and creativity, while leaving the final control of the game developments to the game masters.

**Controllers and Participant Reports**

Experience from *Där vi föl* [7] had shown that the complexity of a social role-playing situation is very hard to capture through surveillance technology. The ambient mood, inner emotional drama and outspoken future plans are not really possible to perceive through technological mediation. When you are not there, it is very hard to understand and conceptualize what is happening. To tackle this problem we applied two techniques.

The first of this was the introduction of a set of specially instructed controllers. Four participants, one in each of the participant factions, had been specially instructed to provide information about the game progress. Their most important role was to send in a report on the quality of a performed ritual, but they would also regularly communicate with the game masters on the progress of the game from the participant perspective. In addition, they were forewarned about particularly important game events so that they could secretly help the participants to be in the right places at the right times.

The second technique was to require all participants to write a daily online diary about their game experiences and thoughts from a in-game perspective.

**Everyday Technology**

Experience from the ARG scene [11, 17] argues that it is efficient to use the participant’s personal communication channels for game information. This immediately introduces a life-game merger and creates a light paranoia: at any time your phone rings, it might be a message from the game. *Momentum* adhered to this approach, by introducing non player character’s (NPC) that only where contactable through everyday technology: Skype, phone, SMS, email and regular snail mail were used as communication channels.

**The Game Mastering System**

The Game Mastering system for *Momentum* was designed and developed closely together with the game-design. Focus was placed upon building a system that supported the process of decision making by live game masters. The GM system was a browser based application, providing integrated access to the most important information and communication channels between the participants and the game masters. The most important information kept in the GM system was:

- Static information about the participants, including contact details, a picture, and information such as special skills, medical information, driver license, etc.,
- A log of all messages that the participants had sent and received through the various communication systems,
- Access to the in-game diaries,
- Logs of participant activities around and at the nodes in the node game,
The system enabled the game masters to
- Upload new sounds and make them available through the EVP machine
- Communicate with the participants through the ‘ghost chat’ system
- Add nodes and node sounds to the node game
- Modify the state of a node (e.g. mark it as captured by one of the fractions),
- Send SMS to a participant’s private phone (for both in-game use and for off-game emergencies).

The most important design goal for the GM system was to make information about the game and its state continuously available for the game-masters, wherever they were located. A collection of screen views were used, each providing an overview of a particular aspect of the system content. These were central especially when the game masters changed shifts and needed to communicate the state of the game comprehensively. In detail the screens were:

- player screen,
- character screen,
- location and node screen,
- sounds screen,
- participant reports screen,
- chat screen.

In addition to the integrated GM system, the game masters used separate (proprietary) interfaces that plotted the participants’ GPS positions on a map, and operated the video surveillance equipment.

**EVALUATION METHODS**

The Momentum game has been extensively evaluated both with respect to the player and the game master perspective [16]. In-game ethnography was complemented by the direct observation of the game masters, and players as well as outsiders were interviewed before and after the game. Some selected players also filled in surveys during and after the game. In addition, the in-game diary system provided useful information also for evaluation purposes. Video material and logs from the automatic location tracking were available but used to a lesser extent in evaluations. In this paper, we restrict our discussion to game mastering.

**EXPERIENCES OF GAME MASTERING MOMENTUM**

A game that denies its ludic nature automatically leads to problems for game mastering. As the event cannot be discussed, presented or viewed as a game by the participants, all game mechanics need to be rationalized away and explained within the game context. This problem is one that Momentum shared with its predecessors Carolus Rex and Där vi fäll, but it was accentuated by the long duration of Momentum. As the game masters had written themselves out of the story, they effectively had to hide from the participants for the five week period the game lasted – a difficult task since their main game master locale was placed in close vicinity of the participant’s high quarters.

In effect, the successful run-time game mastering of a game this long is one of the major achievements of Momentum. Aside from a handful of minor peeks behind the magician’s curtain (such as accidental spotting of a game master on a street where he shouldn’t be) the seamlessness was upheld successfully, and the game master interventions into reality were successful in generating a consistent illusion of a magically enhanced real world.

“Q: Did you wonder how the game masters found out about everything?

A: I did wonder about it, but I was thinking that they were reading reports, maybe. And I was considering that there might be microphones at the actual sites. … it never figured to me that they could actually have spies … or that they were part of our team.”

(Male participant, post-game interview)

**Video Surveillance**

The lesson learned from Där vi fäll video surveillance was that cameras providing overall views are almost useless; they require constant monitoring and provide little information on social situations. In Momentum every camera was given one single question to answer, such as “Is there action in war room?” The most effective installation was a pan tilt camera mounted above the reactor core. This camera was mounted so that the game masters could see the facial expressions of the person using the EVP machine. The functionality of this camera was so good that the game masters could assess the mood of the participants and how they reacted to messages. This gave ample opportunities for a dramatic, interesting interaction.

**Experiences on Node Game**

The split of actuation and decision making in automated (the node search) and manual (rituals) categories worked out well. The automatic feedback provided by sounds and vibrations allowed the players to play the game on their own as they were out on the streets doing their rituals. Only after the ritual, game masters and controllers needed to judge the success of the ritual. This way the pressure on the game masters was eased, while the participants would still get the instant feedback they needed on the streets.

Node capturing was however less appreciated by the participants than the play created by the communication channels in the HQ, and the story-driven quests placed in the city. The competitive aspect made participants focus on finding and capturing nodes with the expense of creating believable rituals. The node game became detached from
the storyline of the game. The design intention was that the participants themselves would create stories built on their activities, but this did not happen.

“I think one of the bad moments was after we saved 93 … we’re sort of told that we should go on doing these nodes, but no-one knows why.”

(Woman participant, post-game interview)

The Game Master System
Almost all of the information in the game master system was used in game mastering. For example, the personal photo and description on the player screen proved very valuable as they enabled game-masters to pick out and identify participants in a crowd, and data on special skills provided understanding on how difficult a certain challenge would be to a participant. About one week into the game, the game masters were able to draw upon the combined information to deduce the play style and preferred play times for the participants. Free-form notes were used as a means to communicate between game masters which individual plots that had been set in motion for that character. The sound screen and the chat screen were the primary means for documenting plotlines. When a game master started the day, checking the activity log in these windows gave a general idea of who has been playing recently and what had been happening. Still, the overall assessment from game masters was that the interface lacked an adequate overview of the current game state.

The challenge of constant attention was eased as the game went on. The game masters adapted their schedule to player activities, discovering that the nobody was after four in the morning and before the next afternoon.4 The game masters still had to work in shifts and the web-based GM interface was instrumental in making this possible. Although the game master central was rigged close to the participant’s HQ, game mastering could be done from any location with an Internet connection. Hungry, frozen and bored game masters would sometimes move out of their central and work from home or from a café. When called upon in the middle of the night to author some additional content, they could go back to sleep afterwards.

In-game Diary
The diary proved to be a valuable sensory technique in the game, both from the participant and the game master perspective. It provided the participant a way for the participant to conceptualizing and storing their experiences, thereby supporting their contemplation and narration of their experience.

At several occasions, the diary was also used as an implicit communication channel; while kept in the story context of the game there were several entries that were thinly disguised comments and requests directed towards the game masters. The diary provided an inside perspective of the unfolding of the game narrative for the game masters, allowing successful decisions regarding what information to inject in the game and selecting the participant receiving it. Without diaries it would have been impossible to know what information was internalized, how it was interpreted, whether it was communicated to other participants. By using the diary information, we could build upon interpretations.

The central risk of the diaries was that since they were kept in-game by the characters, the participants had no obligations to be honest or open in the diaries. In fact, they did even have good reasons to lie and mislead in the diaries. Fortunately these risks were not realized during Momentum.

Controllers
The introduction of the controllers was perhaps an even more important feature. The diaries only collected slow-paced and uni-directed information about the participant experience. The controllers could be contacted instantly and provide answers to specific questions. Can You See Me Now resulted in similar findings [4].

A problem with the controller solution was that the controllers could not be everywhere and play all the time. Since the majority of the participants did not know about the controller role, they frequently started activities without one present.

To circumvent this restriction, the game masters told the controllers what was planned to happen at certain points in the story. This enabled them to be on the spot for the most important activities. Guided by information from game masters, the controllers could sometimes propose actions to the rest of the group without actively enforcing them. If the participants then choose to do something else than planned,

“Things About the Twenty First Century of Which I Willingly to Approve:
- “Varma Koppen” - it's not quite food, but it's warm and it's there.
- E-Mail - an interesting concept, but now that I grasp the basic underlying magic of it I wholeheartedly approve.
- The Electronic Water heater - does nothing a stove cannot do, but it brings me my tea and soup that much quicker.
- The "Lava Lamp" - I can watch this thing go for hours.”

(Diary excerpt, Woman participant)

---

4 After the game some participants reported being exhausted by the game, especially since there was game content late in the night. Game masters reported the same exhaustion. Apparently the game masters stayed on post because participants were playing late and needed content to play with, and the participants had to stay up in order to react to the content GM:s fed into the game.

5 a Swedish brand of instant soup.
the controller could inform the game masters and these could replan their actions for the new situation.

This created a feedback loop in the game between the participants’ interpretations and the game-masters intentions, where the controllers where moderators and acted as an informed but to the participants unkonwn filter between these actors.

The experience from Där vi föll showed that it is easy to overestimate the capability of the participants in solving puzzles. This problem was overcome by the introduction of controllers. The controllers knew enough about the puzzles and intellectual challenges of the game to provide hints to the other participants when they really needed them. This kept the challenge in the game while still preventing large parts of the usual frustration caused by too difficult puzzles.

A side note is that the controllers enjoyed their role, even if it hampered their immersion.

“[Momentum] wasn’t very seamless for me, since I was a controller, but also I thought it was fun playing as a controller.”

(Woman participant, post-game interview)

ANALYSIS

The Distancing Problem

Eirik Fatland [5] has discussed the core problem of Larp game mastering as one of distance. Before the Larp starts, the participants and the game masters / designers share more or less the same conceptual image of the game (at least if the Larp designers have been successful in communicating their vision). But as soon as the game starts, the actual game experience is created and experienced only by the participants. Through observing the participants, the game masters can make an intelligent guess about their experience, but the larger a larp is and the longer it lasts, this becomes increasingly more difficult.

The diaries and controllers were the major means to overcome this problem in Momentum. The diaries provided a good impression of the first-hand experience, and the introduction of the controllers provided a way to actually engage in dialogue as well as subtly guide the game.

In Momentum, one of the game masters participated the game in person during the first weekend. This was less successful than use of the controllers, as it’s difficult to participate in a game and simultaneously make game mastering decisions. It’s especially hard to communicate with rest of the game orchestration team while staying with the participants. In Momentum the tutorial part run by a GM was judged as too lengthy and boring by several participants.

A similar problem occurred already in Där vi föll, where game masters were communicating with the participants through the tape recorder EVP machine. This setup required them to role-play their characters, forcing them into a mental state where there was little room for reflection and strategic thinking. This was one of the main reasons why the EVP machine used in Momentum was designed to transfer only pre-recorded messages.

Pacing

Designing the pacing for a Larp is very hard even in traditional Larp settings. In Momentum, much of the game mastering tools were put in place to help the game masters to judge and affect the pace of the game.

The pace was largely be set by the participants, or more precisely, by a core team of highly active participants. This group emerged only after a few days of game play; a group of participants that spent much more time in the HQ than the other participants. The game masters responded to this by introducing content into the game whenever these participants requested it.

This could potentially have alienated the larger group of more passive participants, but fortunately the participants were divided into four subgroups with their own motives and goals. These factions stuck together, taking care of transferring information and ensuring that the less active participants were kept up to date with the game. This way, the more active participants upheld critical mass in the game and ended up creating content for the less active participants. As one of the participants, who had been ill for a large part of the duration, stated it in the post-game interviews

“if we hadn’t had these elemental groupings … I probably would’ve felt much more detached during the end, now as you know I had this smaller group and I could connect to them and get up to date.”

(Male participant, post-game interview)

Furthermore the game masters, who were aware of activity levels, could set up quests with a specific demand that certain participants had to be present. This caused the more active participants to lure the others back into the game.

During the post-game interviews, both the active and the passive participants felt engaged in the game and none were alienated. At the same time, all participants including the most active ones felt guilty that they had played too little! This comment should be seen in light of the fact that these participants would spend several hours each evening in the HQ. The game was perhaps a bit too effective in creating a highly engaging experience.

Railroading and passivity

Game mastering will sometimes be extremely frustrating to the participants. Two main risks with game mastering are that it may create a railroaded experience, and that it might render the participants passive.

‘Railroaded’ is a derogatory term for role-play scenarios which are experienced as a pre-determined sequence of events over which the participants have little or no control. The problem is that whenever a Larp is staged, the participants will pass through only one of a set of possible paths. Even the richest scenario can thus be perceived by the participants as railroaded. Heavy game mastering may
lead the participants to believe that the experienced story line was the only possible story line.

The second and more serious risk is that game mastering may hamper the participant’s sense of autonomy, creating a passive play style where the participants wait for the game masters to tell them what to do. If this play style emerges, the game is almost certain to be experienced as railroaded, since the game masters will be forced to steer the game in order to make anything happen at all.

*Momentum* was designed to open up during the game, starting with fairly railroaded experience but forcing the participants to get more active during the weeks. For example, the first weekend ended with an in-game disaster forcing the ‘tutor character’ out of the game, leaving the participants on their own. This weekend was followed by a game period of very little game-mastered activities, to encourage the participants to take control. A similar structure was implemented after the mid-game high intensity event. The two last weeks of the game were devoted to the node game, in which the participants again were pacing the game.

From the participant interviews we can conclude that very few participants experienced *Momentum* as being railroaded. The passages from game master driven game to participant-driven game worked, but they were not frictionless. After the introduction weekend, the participants felt very unsure of what to do. To spur some activity in the participant group, the game masters added more quests and puzzles. This triggered a higher degree of self-driven activity in the participant group. Similarly, the participants were also slow in picking up on the node game during the last two weeks.

**CONCLUSIONS**

Runtime game mastering is a powerful tool in guiding a pervasive game towards an artistic vision and a strong emotional and engaging experience, which can make it possible to tailor the game experience for the individual participant, or a group of participants, to fit the intended narrative as well as their interpretation of it. Game mastering enables a game that is co-created by the designers and the participants in collaboration. Successful game mastering relies on game masters having reliable and adequate sources of information that do not only external support supervision of game activities, but also provide an insight into the subjective experience of the participants. In this article, we have brought forward two such tools: the introduction of the participant diaries and the controller function: participants that take an intermediary role between the fully immersed participants and the game masters. Technology-based surveillance is a useful complement, but game mastering with only surveillance equipment is problematic especially in spatially distributed games.

Game mastering also requires subtle means for intervening and guiding the game. In *Momentum*, these means were primarily means to communicate with the participants and to distribute information to them. This approach, we argue, is better than when the game masters personally step into the game. It is almost necessary in a seamless game, to maintain the ‘this is not a game’ illusion. It also enables the game masters to stay emotionally detached from the game to enable adequate judgements.

**A Post Mortem Revolution**

During the very last days of *Momentum*, the players took control over the story line. Edged on by the game masters acting as ‘elemental ghosts’, one per faction, the players had been struggling for control over Stockholm by capturing nodes. Two of the factions were about to win over the others. One of the factions – wishing to win alone – found a means to destroy the node that the other faction already had captured. But instead of turning this against the other faction, the group of active participants decided to join forces and use this knowledge as a weapon against the faction leaders. They threatened to destroy all of the nodes in Stockholm unless the leader gave up their leadership and let the dead rule themselves. Perplexed and thrilled, the game masters acted as the four angels, which finally, grudgingly, accepted that they were defeated. As one of the participants wrote afterwards in his online diary:

“At five o’clock this morning it was over. The elemental factions had disassociated from the awakening souls and promised us a rough welcome.

They sent revolutionaries and got a revolution, what did they expect?”

*(Male Participant, Diary entry)*

The ending illustrates beautifully the power of game mastering in live role playing. This ending was one that the game masters had not thought of in advance: although they had foreseen an ending where the participants refused to fight for power, they had not expected it to at this point and not by these means. Accommodating for such a turn of events is only possible in a game-mastered game. In an automated game, the game engine would not have recognized what was happening. In a Larp with no game master involvement, there would have been no response to the player’s initiative.

**Acknowledgements**

*Momentum* was produced in collaboration by SICS, Interactive Institute and the company P as part of the EU FP6 project IPerG. The authors wish to thank the participants of the Larp for their invaluable input and feedback. Special thanks go to the participants acting as Austin Osman Spare and Carlo Giuliani, who wrote the diary entries cited in the article.

**REFERENCES**


