

Designing for Location-Dependence

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ABSTRACT

This paper proposes a methodological framework for use in designing location-dependent games or experiences. An increasing interest in this genre has given rise to a number of common issues surrounding the design and development of these types of experience. Specifically, the treatment of and approach to the use of location gives rise to particular design considerations. The framework proposed here aims to highlight these and provide designers with tools for use in addressing these.

Keywords

Design framework, methodology, location-based, locative experience, game design.

1. BACKGROUND

Location-dependent games are generally multiplayer, interactive games that occur in both a physical and digital context. In relation to other game genres, such as mobile or pervasive games, location-dependence overlaps these to encompass those particular games that rely on location and/or player position as an intrinsic aspect of play.

An analysis of current games within the genre revealed that location-dependence manifests itself in a number of different ways and with varying levels of dependence. Location-specific experiences such as *PacManhattan* [10] and *Can You See Me Now?* [3] were originally created for deployment in a specific city location and in the case of *PacManhattan* [10] employed particular aspects of that location within game play. Since then, both experiences have been deployed in a number of different locations, each occasion requiring adjustment for the new location. The level to which a game is location-specific will impact the ability for it to be ported to alternative locations. In the cases where the emphasis is on the *type* of location, rather than the specifics of a particular location, portability is increased. *M.A.D. Countdown* [7] is an example of a location-specific experience that would not be able to be moved as the game was designed for a specific building and game events were designed for and around particular sites and objects within the building.

Other experiences approach location by maintaining an awareness of the player's location in a number of different ways. Mobile games *Gunslingers* [8] and *Mogi Mogi* [9] rely on mobile cell identification to determine a player's general location. *Paper Chase* [4] and *Can You See Me Now?* [3] use GPS (Global Positioning System) devices to pinpoint players, leading to some issues with the perceived accuracy of GPS information in low signal areas and the release of game information specific to GPS coordinates [6]. *Pirates* [2] takes a different approach again, using sensors to determine the player's position as they approach objects within the site. This approach to location-awareness

relative to objects meant that players did not have to possess particular types of devices in order to play.

A review of design methodology and game theory was conducted in order to inform and ensure a cohesive framework, discussed here are those that have a major influence upon this work. The Locales Framework [5] approach to analyzing site and interactions was a key factor in defining areas of this framework. Locales provides designers with the means to isolate particular aspects of the work-a-day world for analysis and understanding, and is intended to form a bridge between ethnographic analysis of site and the design of solutions for that site. It considers not only the practical aspects of tasks, tools and resources but also the social aspects that surround and impact upon these. Formed around the notion of centers and the perspectives from which these are viewed, the framework defines five key areas, locale foundation, civic structures, individual views interaction trajectory, and mutuality. These aspects are concerned with describing the social world and its 'site and means'; external influences upon the world; the people involved and their level of commitment and engagement; the interactions, their sequencing and the conditions that affect them; and the provision and perception of information in the world.

Concerned with the study of computer games, Aarseth [1] defines three dimensions for use in describing games. *Game world* encompasses the fictional, visual, auditory and topographic content of a game. *Game structure* describes the rules of play and sequences of events that allow players to advance in the game. *Game play* describes player actions, strategies and possible motives in playing a particular game. Whilst these may be described separately, there is a strong interdependency between them that can alter the game when one dimension is changed. These aspects have been expanded upon to allow for the fact that location-dependent game play may occur in multiple modalities, and that interactions in the game may occur across the physical/digital divide.

Polson [12] builds upon Aarseth's categorization to create a theoretical framework for evaluating mixed reality experiences. She describes a set of tools used in the design and production of such experiences, these being enablers, agents and nodes. *Enablers* are described as the tools that are used to broadcast and/or receive game information and facilitate communication between players and with the game. People and/or characters involved in the game who can impact upon game play are labeled *agents*, included under this heading are other players as they can also affect game play. Of particular interest, in proposing this framework, are *nodes* which refer to the points at which game information is exchanged, the actual physical or virtual location at which this occurs. I have expanded upon this notion to include

considerations of the resources, interactions and styling of the event to provide a higher level of detail.

2. PROPOSED FRAMEWORK

This framework has been proposed to provide a toolkit for design that considers the common aspects of location dependent games. It operates on two levels, the first being *game foundation*, dealing with the establishment of a strong basis for design, identification of the driving force and the analysis of site, resources and people. The second *game design*, concentrates on the design of the actual game experience and focuses the information gathered in game foundation. Figure 2.1 gives an overview of the framework aspects. This framework is concerned primarily with the design process and with providing a script for later development and implementation rather than defining particular implementation processes or methods.

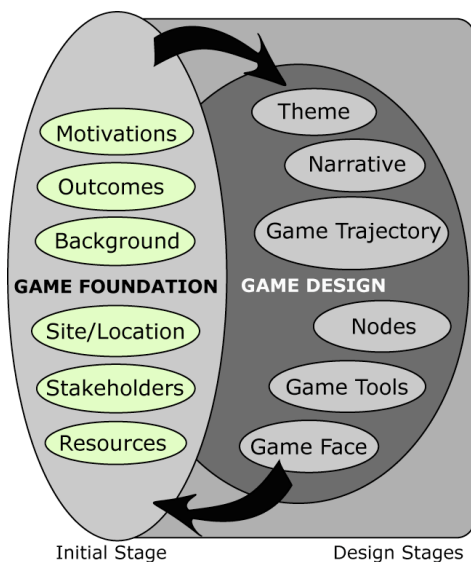


Figure 2.1 Framework Outline

2.1 Game Foundation

Establishing a strong foundation prior to the design of the actual-game provides designers with a record of the reasons for design and a method for validating design decisions as the process evolves. The game foundation is primarily concerned with enabling designers to consider all aspects surrounding the design of a location-dependent game. The level of detail and clarity in these aspects will increase as the process evolves and may inspire game ideas. These aspects incorporate:

- Motivations
- Outcomes
- Background/Precursor
- Stakeholders
- Site infrastructure and access
- Available resources and potential technologies

2.1.1 Motivations, Outcomes and Background

These aspects are concerned with the reasons behind creating the game, the desired outcomes of the game and any prior work that applies. The motivations can be considered as the games' 'mission statement' or driving force, providing validation and justification for the creation of the game. The process of defining the outcomes of the game helps to cement the motivation behind the game and

provides a way of evaluating success. The desired outcomes can be described from different perspectives, for designers, players, stakeholders and industry. Outcomes may be qualitative or quantitative, have commercial expectations or research aims and in themselves will suggest methods for measuring their success.

In some cases, the game may be intended to improve upon an existing event, to solve a particular problem or to evaluate a new technology. Identifying the reasons why the previous incarnation/s did not succeed will help to cement the games outcomes and to shape the actual game design. The determination of what it is that designers want to know or achieve through the games' design will cement intended outcomes and ensure the game meets these needs.

2.1.2 People, Place and Resources

To ensure the success of the game, an understanding of the potential or intended audience is essential. Stakeholders fall into three main categories from a game perspective, *primary* are the players, *secondary* encompass any non-playing participants directly involved with game-play or game-orchestration, and *tertiary* are any other interested parties who may be impacted by the game. Tertiary stakeholders may include any investors in the project, direct sponsors of the game, and/or the local community within the site.

The location in which the game will be played needs to be analysed from a number of angles. The type of location/s the game may potentially use will impact upon the design of the actual-game, the zoning of the area whether it be urban, suburban, a shopping or entertainment precinct or industrial, can influence the style of game events that may occur there. In conjunction with this, considering the culture of the site in terms of the types of people that frequent the area, what 'head-space' they are in when there and the types of activities that generally occur.

Access and how people perceive access within the site will affect how players interact with the location. By defining areas of public access and the degree to which familiarity affects awareness of this will ensure that all players are able to access game elements. Transport to and from the game site/s needs to be considered, in conjunction with the intended players and their modes of transport, to allow for maximum access to the site. For example, if a game event is located in a site that is difficult to get to players may be reluctant to invest the effort in travel, potentially reducing their interest in the game.

The identification of existing resources, site- and player-owned, will allow designers to consider these for use in the game. In identifying the site-owned resources, designers will need to determine how to access these and at what cost. Depending on the intended player group, certain assumptions may be made about the base level of technology or resources that they have access to. For example, given the current uptake of mobile phones, it is safe to assume that the majority of players will have access to SMS. Although this does not ensure that players will have access to applications such as MMS, as this requires particular handsets and operator set up. In the case where new technologies are being investigated, there is a need to understand the true cost of introducing these to players and site. This incorporates not only the monetary cost of acquiring the technology but also the potential issues surrounding development, integration and distribution.

2.2 Game Design

This section of the framework is intended to provide designers with the tools for designing and documenting the actual game. It is proposed in such a way that it can be later used as a script for the development process, with the game trajectory in particular allowing for this. As with the game foundation, the level of detail, in defining aspects of the actual game, will evolve over the design process.

2.2.1 Theme

Operating at a meta-level, the theme defines the style of game to be developed providing a high level description of the games intention. For example, in *Can you see me now?* [3] the theme is one of pursuit and evasion. Themes may be as simple or complex as the designer desires, and help to define the essence of what the game is about.

2.2.2 Narrative

Taking the theme to a more detailed level, narrative provides a storyline and context for play, see Figure 2.2. The linearity of the narrative can have a strong influence on the style of game and its replayability [11]. Linear narratives flow clearly from one point to the next and become known quickly by players. Those with a lesser degree of linearity, and which may have sub-narratives, allow players to explore areas on replay that they may not have done previously.

For players, the narrative can emerge and increase in complexity as they progress further in the game. Levels of narrative may also be used to reward players as they progress by revealing previously hidden layers in the game story. It is important to note that games do not necessarily need narrative to be successful. For example, *Take It!* [13] provides exciting game play without the use of narrative by operating in the higher theme level.

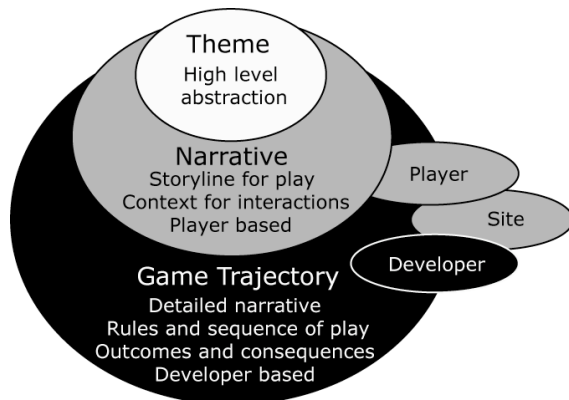


Figure 2.2 Relationship between Theme, Narrative and Game Trajectory

2.2.3 Game Trajectory

Drawing on Aarseth's [1] concept of game structure and building upon the interaction trajectory aspect of the Locales Framework [5], game trajectory outlines the rules and sequencing of the game. It is here that the temporal quality of the experience is defined, from the overall time frame to the sequencing of individual interactions within. It provides solid linking for nodes within the game and deals with the rules surrounding not only game play but also game responses to player actions. This aspect takes the narrative a step further into the practicalities of game definition,

and collates the information detailed within the nodes to provide a script or checklist for use in development.

2.2.4 Nodes

Working from the idea of nodes in Polson's work [12] as representations of the sites and intersections for the exchange of game information, nodes in this instance have been expanded to include considerations of public face, interactions, means and relationships from Locales Framework [5]. They are intended to form the stop point descriptors for interactions and/or events that occur during the game.

A node can be considered a puzzle piece with each one describing a part of the game whole, which in the initial stages of design allows conceptualization of smaller ideas without needing to finalize an overall picture. The granularity or detail of the nodes will depend upon the stage of design.

Each node can be defined by its 'centre' or core, and further described in terms of the site in which they are placed, the game tools required, positive and negative outcomes, inner trajectory, public face, type or theme, and its relationship to other nodes. The relevance and detail of each aspect will depend upon the style of node being described.

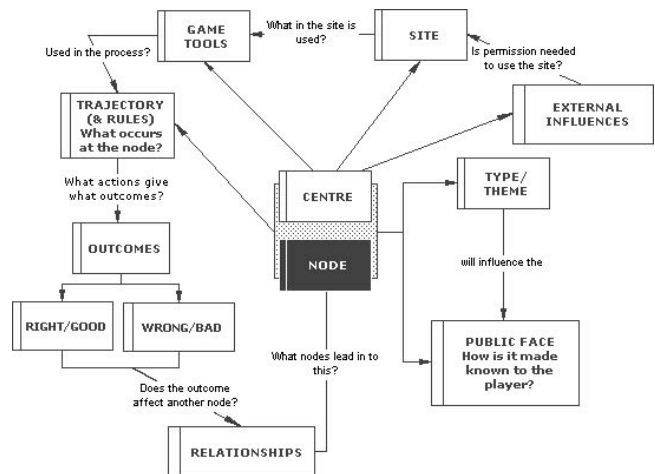


Figure 2.3 Node Description Overview

2.2.5 Game Tools

For any game there will be a particular set of devices or technologies that will be needed for game-play. Moving on from the resources identified in the game foundation, game tools isolates the particular 'things' needed to allow the game to function. This will encompass the resources needed for both the back end system and front end devices used for interaction. Game tools can be defined in three main areas, those that pre-exist within the site, those owned or assumed to be owned by the players, and those created or introduced for the game itself.

Ownership of game tools will determine to what extent designers have control over these and will influence how these are used and depended upon within the game. In assuming the types of devices that players will bring to the game, designers need to define a base level of technology that will support all players yet can be built upon to support players who possess more advanced devices. Game-specific tools, those created or introduced specifically for the game can take a number of forms from public sculpture to

player tokens. When introducing a new technology, issues of integration, access, development and cost need to be considered.

2.2.6 Game Face

Based on Fitzpatrick's [5] idea of mutuality and its concerns with the provision and perception of information, game face is concerned with the public face or identity of the game. This encompasses the visual styling and language of the game and will in part be determined by the theme and narrative. In the initial stages, this is centered on considerations of how the players will recognize the game and its elements within the location. As the game reaches completion, the game face can be used to form marketing packages for the advertisement of the game and the recruitment of new players.

3. CONCLUSION

Early in 2005, an orientation experience was designed using the framework as a lightweight test of its usefulness and to further inform its development. In deploying the experience it was evident that a number of logistical issues had not been considered which caused some problems during the game. Most notable was the lack of back-channel communication between non-player participants and game orchestrators distributed across a university campus, which meant that small issues compounded and we were unable to put the game on hold to address these. In addition to this, contingency plans needed to be considered in case of system failure. When designing the game, there was no consideration given to supporting players and it was made clear that a process for allowing players to get help was needed. This was compounded by the general lack of awareness of the experience in the campus community, which meant that potential support networks were not realised.

Future work will involve expanding the framework to allow consideration of these aspects, and introducing practical and logistical aspects to the game design level. It is hoped that the framework will be taken up for testing by other designers in the field. Further study surrounding its application to non-game experiences will reveal its potential use as a method for evaluating similar experiences. Further informing and refinement of the framework will occur through this process of testing and evaluation in order to provide a relevant and useful tool for designers in the field.

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