Business Model of a Persistent Mobile Game

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Contents

1. Preface ..................................................... 3

2. Introduction ................................................ 4
  2.1. Definitions ........................................... 4
    2.1.1. Value net ........................................ 4
    2.1.2. Business model and revenue model ............. 4
    2.1.3. Persistent mobile game .......................... 5

3. Value net of a persistent mobile game ............... 6
  3.1. The value net ........................................... 6
    3.1.1. The basis of the value net .......................... 6
    3.1.2. The applied value net ........................... 8
  3.2. Analysis of the value net ............................ 8
    3.2.1. Game development activities .................... 9
    3.2.2. 3rd party activities ............................. 9
    3.2.3. Core activities ................................ 10
    3.2.4. Mobile and server operator activities .......... 10
    3.2.5. Localisation activities .......................... 11
    3.2.6. The player ....................................... 11

4. Revenues of a persistent mobile game ............... 12
  4.1. The revenue streams .................................... 12
    4.1.1. Percentual share of collected revenues ........ 12
    4.1.2. License fees ..................................... 13
    4.1.3. Revenues from direct sales .................... 13
    4.1.4. Fixed payments .................................. 13
    4.1.5. Revenues from 3rd party services .............. 13
    4.1.6. Location inquiries .............................. 13
    4.1.7. Data transfer .................................... 14

5. Costs of a persistent mobile game .................... 15
  5.1. The cost streams ...................................... 15
    5.1.1. Research & development cost streams .......... 15
    5.1.2. Production cost streams ........................ 16
    5.1.3. Distribution cost streams ........................ 16

6. Revenue model of a persistent mobile game ........ 17

7. References ............................................... 21
1. Preface

Business Model of a Persistent Mobile Game was written as a part of Wireless Gaming Solutions for the Future (MOGAME) project.¹ The project was coordinated by Hypermedia Laboratory at University of Tampere. The aim of the research was to study game concepts that would be most suitable for mobile devices. Based on understanding of mobile communication and social character of game-play, our hypothesis was that persistent game words, location-awareness, and communication would be important parts of such, next generation game, truly making use of the key characteristics of mobile media. In addition, this project also studied how to combine lottery or money gaming elements into the context of entertainment games in an interesting way. As a part of the research, business models were also studied for future persistent mobile games. In this report MSc. Econ. Tommi Rissanen presents value net, revenue and cost model analyses that are based on analyses of The Songs of North game and data gathered in play testing 2004 and 2005. One of the main outcomes of this study is to point out how challenging it is currently to create a location-based mobile game into a profitable service, suggesting that changes are needed in the pricing structure for mobile game services. The technical, artistic and cultural issues of such future games are investigated in our other publications (information available at http://www.uta.fi/hyper/julkaisut/).

Petri Lankoski & Frans Mäyrä
Tampere, March 2006

¹ http://www.uta.fi/hyper/projektit/mogame/
2. Introduction

This is the second research report on the value creation and business models in the MOGAME-project. As the first report described scenarios of new revenue models for the next generation mobile games, the objective of this report is to give deeper understanding of the actual cost- and revenue streams that are applicable in a persistent mobile game.

This report applies the results of the tests with the game prototype into the scenarios. The value net perspective is also applied to function specifically with the game prototype that has been developed. The purpose of this report is to present a business case for a functional persistent mobile game including the development, localization, and operating the game. The business case also considers the economical environment (number of potential players, willingness of payment) in which it could be profitable to operate a game of the kind studied in this project.

2.1. Definitions

The definition of the many terms used in the mobile entertainment industry is essential, because there are different interpretations of the terms in different contexts. The terms that were defined in the first report will not be repeated here, however.

2.1.1. Value net

In this research the term value net is used to describe the value creation process of an industry. The value creating system is a set of activities creating value to customers. These activities are carried out by using sets of human-, tangible- and intangible resources and they are linked by flows of material, information, financial resources and influence relationships. End customers not only receive and consume the value created, but can also participate in value-creating activities. Activities may be governed by the market, a hierarchy or intermediate forms of co-ordination (company networks). Various economic players may participate in a value creating system by taking responsibility of one or more activities and an economic player may participate in more than one value creating system. (Parolini 1999, pp. 62-63)

2.1.2. Business model and revenue model

Business model is a concept that is used loosely to describe any diversifying characteristic in business activity (Kallio et al. 2002, p. 9). In this research the business model is defined as
follows: “Business model is the practical action plan designed to fit a specific market situation in order to execute strategic plans” (Rajala et al. 2001, p. 20).

Revenue model is a component of the business model. It explains the way in which companies receive their revenues created through value creation (MGAÍN Project Group 2003, p. 18).

2.1.3. Persistent mobile game

Persistent world is a game world in which several elements of the game are retained from remote servers and the current state of the game are same to all observing players. Examples of the persistent elements may include geographic terrain, terrain objects, player/character attributes and skills, player object inventory items and non-player characters. The current states of the persistent elements react consistently to all current observers, the players of the game. Persistent worlds are also called massive multiplayer online games or MMOGs. (Mulligan et al. 2003, p. 480)

Persistent mobile games are mobile games that take place in the persistent world. The mobile device provides also other new possibilities for games: the device is personal, is always carried by its owner and is always connected to a network. In this research report the new revenue models of mobile games are studied especially from the persistent point of view and the other possibilities of mobile devices are not taken into focus.
3. Value net of a persistent mobile game

3.1. The value net

In this chapter the value net of the previous research is first introduced. After that it is applied into the game prototype studied in this project and described in detail.

3.1.1. The basis of the value net

The value net describes the value creating systems as a set of activities from the end customer’s point of view. The creation of the value creating system begins with the identification of the activities in the value net.

The value net of mobile game industry consists of the value net of mobile entertainment and online game industries. The mobile entertainment value net provides the mobile aspect for the value net as the online game value net describes the game aspect of the value creation. Parolini’s definition of value net, which is used in this research, defines that activities must be economically separable. One economic player can be responsible for several activities, however. The purpose of this interpretation of mobile game value net is to help the understanding of the revenue models in the industry.

The activities that are applicable to the value net of the mobile game industry found from the value nets of the mobile entertainment and online game industries are; consumption, billing, distribution, hosting, advertising, aggregation, publishing, licensing, and game development. The value net with these activities is presented in the following figure:

![Figure 1. The value net of the mobile game industry](image)
The customer is in the focus of the value net. Certain mobile games, such as Nokia N-Gage games and other games that can be attached to a physical “product”, can be acquired from the retail distribution channel. Most of the games are, however, distributed through operators and portals. Because the customer billing is dominated by the operators, the online distribution is not very strong. As the competitive billing mechanisms emerge, the importance of operators as the compulsory participant in the value net may decrease. At the moment the operators provide the most cost effective billing and they have the advantage of controlling the huge customer base through their mobile phone customers. The importance of online distribution is constantly increasing, however.

The hosting service provision is the actual distribution channel from which the games are downloaded to the customers’ mobile phones.

Advertising in this diagram represents the advertisements in the portals and also advertising the games in other media such as magazines and television. The advertising can therefore be either advertisements of the games for sale or advertisements of other products that are targeted to the audience playing certain kinds of games that are distributed through a portal.

Aggregators are the wholesalers of the mobile game industry. Their expertise is in the knowledge of the distribution channels. The distributors get a selection of games with less effort from an aggregator than from small publishers or game developers. The publishers or game developers in turn gain the access to larger distribution channels that they could get on their own.

Publishers in the traditional game industry finance the development of the games with advance payments and after the game is ready, take care of the distribution and marketing of the game. The publishing business in the mobile game industry is not that advanced yet and many game developers publish their game titles themselves. As the game productions become bigger, the risks increase and also the size of the industry grows, the publishers will take a stronger role in the Value net.

Licensing is also very popular in the traditional game industry. As the licensing means one more economic player’s mouth to feed and the market is still relatively small, there are not many well known licenses in the mobile game industry. As the Tomb Raider among other well known licence games was one of the first titles published for the N-Gage Game Deck, the situation appears to be changing. Several game titles are published at the same time for PC, game consoles, and mobile devices and this approach maximises the impact that a licensed brand can have.
Finally, the game development is in the end of the chain. Being the ones that produce the titles that should feed the whole value net for a small share of the revenues generated, the situation of the game developers does not seem to be admirable. That is the situation in all industries, however, and the ones that are in the market now may have the upper hand also tomorrow, when the market is matured and the big revenues start rolling in.

3.1.2. The applied value net

The value net model of the previous chapter was applied to the persistent mobile game prototype that was created in the MOGAME research project. The applied value net became slightly more complex than the original model.

The value net is analysed through each group of activities in the following sub-chapters.
3.2.1. Game development activities

The game development activities have been divided into three: game client development, game engine development and game content development.

Game client is the program that runs on the player’s mobile game device. It delivers player’s commands to the game server and delivers game information to the player. The client has a graphical user interface and most of the sound and graphical features that the player gets by playing the game are stored in the client and presented by the commands of the game server. The client also handles the location services for the player and the game server.

The game engine is the actual game. It controls the whole game world and all the players. The game engine provides the commands and information ordered by the game clients and links the information of different players in the same area. It also handles the location data and communication between the players. The game engine is the core of the game and thus the most important part of the development process. The same game engine can be used with different large number of clients and it can be used with different content to create different games that have the same basic functionalities.

The game content includes all sounds and visual components of the game. The content can be divided into universal and local content. Universal content can be used in all games regardless of the localisation of the game, such as spell effects or universal non-player characters. Local content includes special content such as maps or local non-player characters that are tied to a specific game location. The game content development activities deal with the universal content and local content hosting & development (group 5) with the local content.

3.2.2. 3rd party activities

The 3rd party activities include special activities that are related to the game, but tied to a 3rd party. These are services that are not originated from the game but are used to add features to it. They can be generic services or tailored specially to the game. In this applied value net the activities include 3rd party content & technology, 3rd party service hosting and licensing.

The 3rd party content & technology stands for the technology platform and its content that can be applied to the game. This module must be customised, but it must be done by the owner of the activity, because it is often so much different to the other features of the game. In this research a 3rd party feature is gambling that is included within the game. The legislation has strict rules on which companies can practice gambling-related activities and how it must be done.
and supervised. The actual gambling feature and its supervisory process must be created by the authorised company, in this case Oy Veikkaus Ab.

The 3\textsuperscript{rd} party service hosting activities take care of the hosting of the module and its interfaces. Security is a main issue when dealing with gambling. For that reason the hosting of the 3\textsuperscript{rd} party service must be taken care of independently from the actual game. Security must also be considered in communication between the gambling feature and the actual game.

Licensing is an activity that provides efficient ways of distributing the game concept into other markets. Licensing should be arranged by a specialised 3\textsuperscript{rd} party organisation.

3.2.3. Core activities

The core activities include game publishing and game operator activities. These activities are essential to all other activities of the game creation and making business with the game.

Publisher in the game business is a sort of venture capitalist that finances game creation, finishes the game into a product that can be sold, arranges the distribution of the game and finally is responsible for the marketing of the game. In this applied value net the publisher is responsible for early part value creation up to creating the game product and the game operator is responsible for value creation from that point on.

The game operator is needed in online games, where information and parts of the game are retrieved from remote servers. In this game the game operator changes the ready game-product into changeable product-service combination. The game operator also acts as an aggregator that assembles all needed activities and actors together and is responsible for the continuous running and maintenance of the game.

3.2.4. Mobile and server operator activities

This group stands for operator activities that are not tied to one specific game. Such activities are the game server hosting, data transfer service and location data service.

The game server hosting takes care of the actual game servers on which the game engine runs. The server or servers must be secure and safe from electricity failures and they must be able to handle the burden of all players playing the game at the same time.

The data transfer service handles the data transfer between the game clients and the game servers. Data is transferred both from client to server and from server to client. In this example the data is transferred through GPRS-connection, which is at the moment billed by the amount of data transferred.
The location data service is a special service of mobile operators that enable the positioning of a specific player playing the game. The location information is a key element of the game.

3.2.5. Localisation activities

A persistent mobile game is based on the fact that it is played in a specific real life environment. The game environment can be placed on top of real life surroundings or the real environment can be utilised as it is. In either case, there is a need for game localisation, local content creation and hosting and game retail distribution.

Game localisation is an activity where the game elements are placed into the local environment. Localisation includes collecting both the server information and the client information. Translations may be needed and arranging of the continuous development and hosting of the local content. Also, the distribution of the game client must be arranged. The game localisation activity is very close to the game operator activity and the actor taking care of it is a local game operator.

The local content hosting and development was mentioned in the chapter 2.2.1. Local content includes all content needed that has not been developed universally to be part of the game. Location-specific events and game features and maps of the local area are examples of such content.

The game retail distribution is straightforwardly the retail sales of the game client and subscriptions that allow the players to play the game for a certain time. The retail channel can be included in the game in various ways and depths. The retailer can even rent the game devices for the players if that is seen as an economically sustainable activity.

3.2.6. The player

The player is last but the most important link of the value net. The player will bring most of the income into the value net and also takes part of the content creation of the game. The players can be encouraged to involve in the content creation both while playing the game and while not playing it. An essential channel for promoting the game and also providing extra value for the players is an off-line forum in which game information can be distributed from the game operator to the players and also the players can share experiences and even trade between themselves, if that is supported by the game operator.
4. Revenues of a persistent mobile game

In this chapter the revenue streams of a persistent mobile game are introduced.

4.1. The revenue streams

The revenue streams can be divided into seven different categories as presented in the Figure 3. Revenue streams of the value net.

4.1.1. Percentual share of collected revenues

Revenue sharing is the most common way of distributing revenues in mobile game industry. It is based on sharing the revenues but also the risks of the game between the actors of the value network.

In MOGAME value network the revenue sharing is utilised in actions between
- development activities and publishing;
- publishing and game operation;
• game operation and game localisation & retail
distribution.

4.1.2. License fees

License fees are applicable in the case that the game is sold
to different game operators by the publisher. The procedure
follows that of any game licensing process.

4.1.3. Revenues from direct sales

When the final customer, the player, purchases the actual
game client from a local retailer, it happens through direct
sales. The player gets the client transferred through a wireless
connection or on a memory card and pays money for that. At
the same time the player gets information about the local
game events and schedules.

4.1.4. Fixed payments

Revenue streams such as game server hosting and 3rd party
content & technology development and service hosting.
Game server hosting is a scalable activity, thus a certain fixed
payment must be paid to operate a certain capacity of
simultaneous players.

3rd party content & technology is typically an activity
outsourced from the 3rd party service provider as the game
application is not the core business of the service provider.
Another possibility is to apply revenue share in this
development also, but in this case the service is related to
lottery and the distribution of such revenues are legally
restricted.

3rd party service hosting pays a fixed fee for the game
operator for the number of players using the 3rd party service.

4.1.5. Revenues from 3rd party services

Revenues from 3rd party services in the case of MOGAME are
related to lottery, which is highly regulated in Finland. For
that reason the revenues from such services must be
distributed through the actor that has the permission to
operate the lottery activities. The actor that is responsible for
the 3rd party service hosting controls the money distribution.

4.1.6. Location inquiries

The game developed in MOGAME project is based on the usage
of players’ location data. Thus the location of the players
must be found out and it is done by using the location data
provided by the mobile operator. The location inquiries are a
service that is charged by the operator based on the number
of inquiries made. The inquiries can be bundled by the game
server in order to save the costs.
4.1.7. Data transfer

A persistent mobile game is played with a game client that acquires the game event data and parts of the content from the game server. The data transfer is a service that is charged by the mobile operator based on the amount of data transferred. The data transfer is charged from both players and game operator according to their actions.
5. Costs of a persistent mobile game

The costs are not always included in the definition of the business model. In this research the cost streams are in key position in the definition.

5.1. The cost streams

<table>
<thead>
<tr>
<th>Game content development</th>
<th>Licensing</th>
<th>Local content hosting &amp; development</th>
<th>Game localisation</th>
<th>Game retail distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game engine development</td>
<td>Game Publishing</td>
<td>Game operator activities</td>
<td>Game server hosting</td>
<td>Player</td>
</tr>
<tr>
<td>Game client development</td>
<td>3rd party content &amp; technology</td>
<td>3rd party service hosting</td>
<td>Data transfer service</td>
<td>Location data service</td>
</tr>
</tbody>
</table>

Figure 4. The cost streams of the value net

The cost streams of the value net can be divided into four categories as presented in the Figure 4. The cost streams of the value net.

5.1.1. Research & development cost streams

The game development has been divided into three internal and one external activity. The internal activities are the game engine development, game client development and game content development. The game engine development is the most demanding activity, but the product can be used in other projects, which lowers the r&d costs required. The game client development is an activity in which the actual game client and the user interface is created to the wireless terminal. The game content development must be more tailored than the other r&d products. The 3rd party content &
technology stands for an economic player that is not in the game business, but uses the game as a distribution channel to its products. An example of this is the national lottery organisation of Finland Veikkaus that can provide a gambling solution to be a part of the original game. The organisation must develop its solution and interfaces with the actual game in association with the other development activities.

The development costs are rather difficult to define as they depend highly on the proportions of the game and the amount of content that must be created. Here is an example of the costs that the development requires.

The establishing costs refer to one-time establishing cost of the creation of the game.

Finalising the game components into a game product between the development actors and the game publisher involves establishing costs. Also the licensing arrangements to protect the intellectual property rights of the game require establishing activities. Finally, the publisher needs to find an aggregator to co-operate in organising the actual game server operation and distribution of the game

5.1.2. Production cost streams

The production costs are related to the running of the game. They are operational, variable and fixed costs that are generated when the game is put into production, the game servers are running and the players can start playing the game. Production costs are the most crucial group of costs as the profitability of a persistent mobile game depends on the difference of the operational revenues and production costs.

5.1.3. Distribution cost streams

Distribution costs are accumulated on the different activities aiming in providing the game for the players to play. Such activities are the sales of game clients. Also the data transfer from the player to the game server can be classified as distribution costs. Production and distribution costs are very close to each other and both are related to the actions that the player does.
6. Revenue model of a persistent mobile game

In this chapter the applied revenue model is introduced and the business case of the persistent mobile game prototype created in this project is presented.

The following tables present a template to estimate both development costs of a persistent mobile game and the operational costs as well as revenues expected to be collected from players. The template has not been filled in with development costs, because all development processes are unique and because the development of The Songs of North game conducted in this research was done in a university environment which differs somewhat from a regular business use.

The operational costs are based on tests implemented by the Hypermedia Laboratory of University of Tampere at 2004 and 2005. Most of the costs are based on actual facts, but for example the cost of a man-hour is an estimate.

The Excel document that can be used as a tool in estimating the revenues and costs of a persistent mobile game will be available as an electronic appendix of this document.

<table>
<thead>
<tr>
<th>Revenues of a persistent mobile game</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Monthly fees</td>
</tr>
</tbody>
</table>

The revenue sheet of the game is based on assumption of what the players could be willing to pay for a persistent mobile game. It is very difficult to study that in practice, but the research group sees that 15 € is an amount that the target group could be able and willing to pay.

In this calculation, only operational revenues are included. This decision has been made due to the fact that every game development process is individual and the investment decisions on any persistent mobile game should include market information on the possibility of multiplying the game in different regions. The investment decision is thus an entirely different from the estimation of the profitability of the game.

This calculation estimates the break-even number of players in the first single game needed to cover the operational costs. The costs for the subsequent games are
smaller as the resources can be reused. The break even of subsequent games is studied after the first game revenue-cost scenario.

The costs have been divided into costs based on time and costs based on the number of players. It must be noted that these costs only include operational costs, which are production and distribution costs. The time-based costs get significantly lower when the game is distributed to subsequent areas as most of them can be used as they are.

From the cost sheet it is apparent that the location data service is not in relation to other costs. The location data costs are based on the current (year 2005) information from phone operators (0.1 € per location inquiry). Because the persistent mobile game designed in the MOGAME project is based on constant observation of players’ location, the pricing is at present economically impossible.
**Profit-loss sheet**

**Operational profit-loss statement**

**REVENUES**

<table>
<thead>
<tr>
<th>Operational revenues / month</th>
<th>Players</th>
<th>Rev/plr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly fees</td>
<td>300</td>
<td>15 €</td>
<td>4 500 €</td>
</tr>
</tbody>
</table>

**Costs**

<table>
<thead>
<tr>
<th>Operational costs / time</th>
<th>Hours</th>
<th>Cost/mo</th>
<th>Fixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production costs</td>
<td>136</td>
<td>26 €</td>
<td>80 €</td>
<td>3 640 €</td>
</tr>
<tr>
<td>Distribution costs</td>
<td>10</td>
<td>35 €</td>
<td>58 €</td>
<td>408 €</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>146</td>
<td>61 €</td>
<td>138 €</td>
<td>4 048 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational costs / player</th>
<th>Players</th>
<th>Cost/plr</th>
<th>Fixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production costs</td>
<td>300</td>
<td>0,86 €</td>
<td>0 €</td>
<td>258 €</td>
</tr>
<tr>
<td>Distribution costs</td>
<td>300</td>
<td>19,78 €</td>
<td>0 €</td>
<td>5 935 €</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>600</td>
<td>21 €</td>
<td>0 €</td>
<td>6 193 €</td>
</tr>
</tbody>
</table>

**Total revenues** 4 500 €

**Total Costs** 10 241 €

**Balance** -5 741 €

The profit-loss sheet shows that with 300 players the time-based operational costs can be covered, but as the cost of location data service exceeds the revenues, it is impossible to build a profitable service. The pricing of the game that would cover all costs with the presented cost structure would be 34€ for each player with 300 players. As the players would in addition have to pay for the data transfer, additional communication and 3rd party services, it is very high. As a comparison, one can buy 60 days of playing time for a very popular MMORPG, *World of Warcraft*, for $ 29,90 (appr. 24 € in August 2005). Correspondently, for the set price of 15€ to cover all costs and deliver a break-even balance would require the distribution costs to be as low as 0,65€ per player per month.

As the game is multiplied in other locations, up to approximately 75 % from the time-based operational costs can be reduced from the estimation because the basic game operator activities can be used without adding resources in different localisations. Naturally they can be upgraded only up to a certain point, but again that depends largely on the game setting and the way in which the game operator activities have been organised.

The excel-document used in the estimations presented above is based on publicly available information on the hosting services, operator pricing and tests conducted by the Hypermedia Laboratory of the University of Tampere. As
mentioned above, there are many parts of the sheet left open, because for instance the time and costs involved in a game development process is very dependant on the game developed and the developer organisation and its experiences etc. Rather than creating highly inaccurate anticipations of the costs, they are left blank in hope that the structure contains relevant structure and data for the planning purposes of persistent mobile games.
7. References


