

LudoPor – Plataforma de Criação de Jogos de Palavras

LudoPor - Word Game Creation Platform

Samuel Mira

Instituto Superior Técnico, Lisboa, Portugal,
INESC-ID, Lisboa, Portugal
samuel.mira@ist.utl.pt

Rui Prada

Instituto Superior Técnico, Lisboa, Portugal,
INESC-ID, Lisboa, Portugal
rui.prada@gaips.inesc-id.pt

Resumo

Este artigo apresenta uma abordagem para um modelo conceptual para criar Jogos de Palavras. Para a elaboração deste modelo pesquisámos em jogos como o Trivial Pursuit, Scrabble com a intenção de saber as razões do seu sucesso. Baseados nesta pesquisa propusemos um modelo conceptual utilizando conceitos chaves presentes em muitos desses jogos. Este modelo define um Mundo de Jogo e os seus conceitos: o Tabuleiro, o Jogador, os Desafios, os Objectivos e os Indicadores de Desempenho. De seguida criámos o LudoPor. O Ludopor é uma plataforma que utiliza parte deste modelo para criar jogos de lingua portuguesa. Esta plataforma foi criada iterativamente começando em simples protótipos de papel até um protótipo de alta funcionalidade utilizando testes com utilizadores como principal linha de orientação. Para ajudar nesta tarefa tivemos a ajuda de muitos utilizadores incluindo pessoas do Ciberdúvidas (uma comunidade de língua portuguesa). Este protótipo de alta funcionalidade tem também como objectivo criar jogos para o Ciberdúvidas de modo a que possam ser utilizados na sua página da Internet.

Palavras-chave: Jogos de Palavras, Plataforma para criação Jogos, Mundo de Jogo, Mecânicas de palavras

Abstract

This article presents an approach to a conceptual model to create Word Games. We researched successful word games such as Trivial Pursuit, Scrabble and more to establish reasons for their success. Based in this research we proposed a conceptual model using key concepts present in those games. The model defines the Game World with concepts such as the World Representation, Player, Challenges, Links, Goals and Performance Indicators. Afterwards we created LudoPor - a prototype of a platform using some of the referred concepts. The prototype was made using an iterative design starting from paper prototypes to high fidelity prototypes using user evaluation tests to guide the right path. In this task we had the help of many users including persons of Ciberdúvidas (a Portuguese language community). Another objective of LudoPor was to create games for Ciberdúvidas that would be shown in their website

Keywords: Word games, Game Creation Platform, Game World, Word games Mechanics

1. Introduction

This article shows an applied investigation to develop a conceptual model that can be used to create successful word games. To create such model, we first researched in successful Word Games to establish their reasons for success and, based on those reasons, we elaborated a

proposal for such model. Finally we made LudoPor, a platform that uses a trimmed version of the proposed model to create Word Games. So our goals and contributions with this work are:

- Conclusions about success elements in Word Games;
- A conceptual model for creating word games that incorporates those success elements,
- A platform with the key concepts of the conceptual model able to create word games.

This research was motivated by two factors: the increase in the interest in word games and the possible of their use for education and learning. The increased interest in word games is visible with the success of many games in the Internet. We can see this popularity in the scores of the following Figure 1.

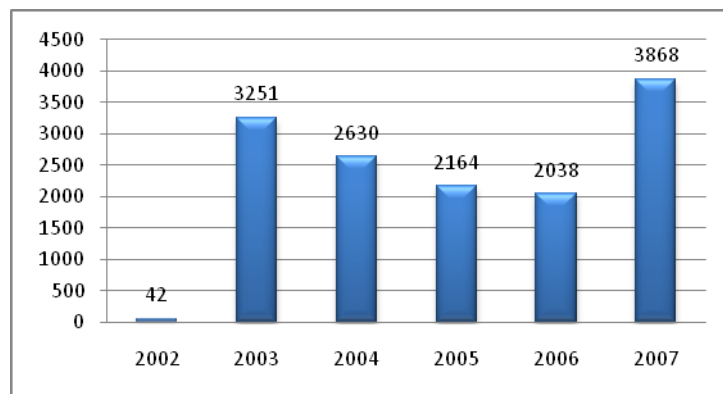


Figure 1 Evolution of Word Games Scores

Note that the score stated in Figure 1 represents a formula for calculating the most popular games. It relates a genre of casual game with the top of most played games per week. In the figure we can see the added scores per year for the genre Word Games. The figure, statistics and the score can be seen in reference [1].

As we can see Figure 1 the scores of Word Games are conclusive about the popularity of the genre. But could this popularity be used not only for relaxing but also for learning purposes? Well recently a report about the use of games in schools has been conclusive.

As stated in “Games in Schools Report” [2], made for a partnership between the European Schoolnet¹ (EUN) and the Interactive Software Federation of Europe² (ISFE), games can provide a valuable resource in schools and education. They can extend outside the classroom and provide a digital platform for study aids.

In this work we had the help of Ciberdúvidas³. They are a community specialized in the Portuguese Language. In their internet portal, they answer questions send about several subjects concerning all aspects of Portuguese Language, for example, the origin of words, grammatical issues, and more.

They want to add some dynamic and interactive content, such as games to increase diversity in the website. So they cooperated with us to provide information and help in creating a

¹ <http://www.eun.org/>

² <http://www.isfe-eu.org/>

³ <http://www.ciberduvidas.pt/>

platform that allows them to create such games. The games themselves should not be the main reason the users go to the website, but to increase motivation for them.

Since the platform is made to be used by this community, the generated games must have distinct characteristics. They should be able to be educational, use word games, must be able to approach an adult audience (the main target of the website) and must be able to be distributed over the internet.

The platform is focused to be used by a community that have little or none computer programming skills so the platform has to be graphical and should be easy to work with.

2. Related Work

In this section we present conclusions about our review of word games. The extracted information is important to the creation of our Model and LudoPor, our platform. We reviewed over 12 games like Scrabble¹, Trivial Pursuit², Bookworm³, Chicktionary⁴ and more.

These games are played has a source of entertainment, but they also have an educational purpose. The most important characteristic to retain (for this work) is the way that they are played – its mechanics.

One of the first and more important conclusions that were taken was that all the mechanics are simple but hard to master. For example anyone can play Scrabble but the best have huge knowledge of their vocabulary. Also in order to be good at those games requires learning and that's one characteristic that we are very interested – the educational purpose.

A feature common to some is that they are the called Party Games. These games are made to be played in groups and require an amount of social interaction, making them adequate to be played in a community. This also adds an interesting aspect to games, the competition. Adding some competition to educational games is a good technique to try to push its players to learn but it's also something to be careful about since not all players are competitive.

The individual word games are usually games with none or little pressure. They are made to relax the player while “teaching” them. Mechanics of such games are simple but have some sort interaction like searches on internet for hints or a possibility of losing based on the player performance. These techniques increase playability and decrease the monotony of these games when played for a long time.

Finally some of the games reviewed are “training” games –where the player has the perception that he has problems in some Language aspect (like grammar) and wants to train that aspect. These games are made to be educational. Players do not play often and if they do is for little time. They may lack motivation to play or they just finished training the subject there were looking for.

¹ <http://www.scrabble.com/>

² <http://www.hasbro.com/trivialpursuit/>

³ <http://www.popcap.com/gamepopup.php?theGame=bookworm>

⁴ <http://www.clubbing.com/Pages/Games/GamePlay.aspx?game=Chicktionary&mode=play>

Other than those conclusions, we reviewed the way that those games are played. The Related Work now present a list of Word Game mechanics used in those games which are:

- Question and Answer - where someone, player or not, asks a question to a player that he must answer
- Multiple Choice - faced to a question the player must answer one in a set of predefined answers
- Matching - the player is asked to connect two or more items
- Filling in the Gaps - consists in a text or phrase with open spaces that the player must fill to complete
- Word Forming - using a limited number of letters the player must form words
- Word Searching - the player must search and find words in letters disposed on a grid

3. Conceptual Model

The following section shows and discusses the conceptual model for creating word games. The most important concept is the Game World and it is divided in 5 components which are World Representation, Performance Indicators, Goals, Challenges and Player We believe that concept and components are a foundation for creating successful Word based games.

Most of the games reviewed do not have only the word mechanics but also players, board, goals, story and more. These concepts constitute the game world. The game world is, basically, everything that is represented in the game and all games have its own game world.

We researched about the Game World and elaborated a list of 5 key concepts that successful word games have. They are: a World Representation (in our model we chose a Board), Players, Challenges, Performance Indicators and Goals.

The World Representation is basically the environment where the action takes place. In this thesis we chose the board as world representation since it is a common, flexible and familiar representation.

The game world can have one or more Boards which can be dynamic or static. Dynamic board change independently of the player actions while static do not. A very important aspect about the world representation it is his layout. Deciding where to put challenges and defining links to create paths is critical and often define if a game is good or bad.

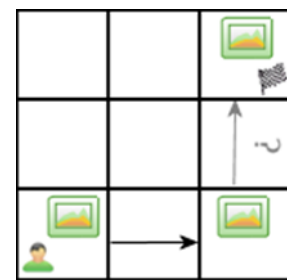


Figure 2 A example of a possible Game World

Game goals are objectives that the player must accomplish in the game. These objectives can be dynamic, depending on the performance of the player, or static being pre-established by the game designer. Goals can also be primary, secondary or final. The distinction between these type of goals is how affects the progress of the player in the game. Overcoming primary goals progresses the player towards the final goals. These final goals are where the player wins the game. Secondary goals do not advance the player and exist to reward players and extend the game playability.

The performance indicators are statistics to establish the performance of a player throughout the game or a challenge. These indicators can be score, game time and items.

Score is a numeric counter that may increase or reduce depending on the player performance on a challenge. Game Time is the representation in the game world of real time. Since it is only a representation the time, it can be distorted, illogical or even with its own economy. Finally items, which are objects representations in the game world. They can be collected and used by the player. Some players can see items as trophies adding motivation for them to play the game.

Challenges are the tasks that the player must perform in the game world that allows them to accomplish a goal. They are based on the mechanics retrieved from the Related Work. They can be adaptive or not depending of the state of the game world. If the challenge changes according like, for example, the performance indicators then it is adaptive. Otherwise it is a static challenge.

Since challenges are the basic tasks of the game they are responsible for providing feedback. This feedback can be related to the game word where they change the performance indicators of the player but it can also be directly to the player when certain actions or conditions are met to warn the player. This direct feedback is very useful when we need to inform the player about choices and what are their consequences.

Finally the player, the most important component of the game. The two important aspects of players are their state and representation on the game world.

The state can be always the same or it can adapt depending on the progress and performance of the player on the game world. For example, in Trivial Pursuit the number of wedges on the piece is a mark of the state of that player towards the final goal. The player representation is called avatar and can be customized to reflect the state or to motivate players.

Also a very important aspect of the player is its movement on the World Representation. The player's movement can be linear or random like in Trivial Pursuit. It can also be dependent of player performance or hybrid (random movement with bonus for good performance). Movement can also be predictable or unpredictable. Predictable movement is if the player can understand that by achieving a certain performance he will go to a certain point of the world. This implies that the player has enough knowledge of the world to understand where will he go. In unpredictable movement the player does not know where he will go, for example, a random movement. Unpredictable movement remove control to the player and may leave him frustrated.

We believe that the use of these concepts as the basis of the Word Games will allow game designers to create games that can motivate players

4. Implementation

Throughout the evolution there were six prototypes made and tested. In this article we focus on the first paper prototype, the game prototype and the final high fidelity prototype because they were the most important.

The first was a low fidelity prototype made with pencil and paper as we can see in the followings Figure 3, Figure 5 and Figure 4. This prototype had the main objective of establish if the concepts referred in the conceptual and their hierarchy were clear to the end users.

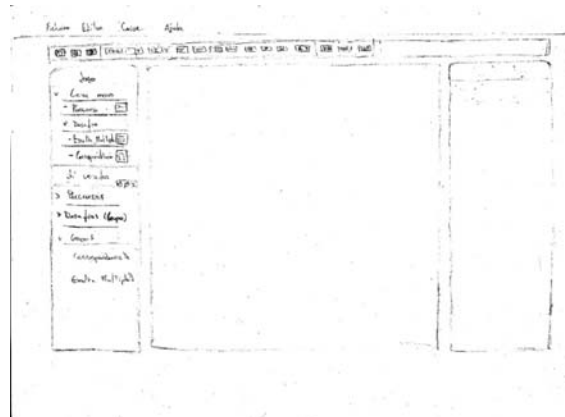


Figure 3 Board of the first Paper Prototype

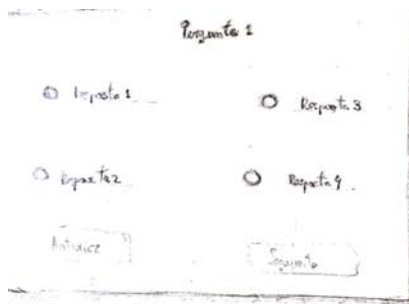


Figure 5 - Multiple Choice

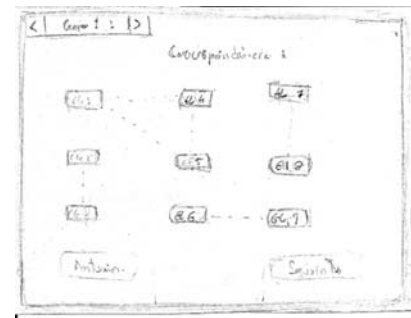


Figure 4 - Matching

This prototype was evaluated by five users. Three of them were teachers that use the computer at a regular basis. The focus on educators occurred since this particular group were the main target audience of the platform. The other users were young adults that worked every day using the computer and they are efficient in testing and capturing interface problems.

Users were provided with simple tasks reporting what they should do. It was recorded if the users were able to perform tasks alone or if they needed help. It was also measured the total time of the session. Besides these stats there were recorded notes of issues and problems that users encountered when experimenting with the prototype.

The retrieved measures stated that some users were unable to continue without help and failed in the first five tasks. In those tasks users were lost and did not understand what was to be done and how would it influence the game. The medium time of completing the tasks were about 40 min which most were spend exploring the interface. After learning the interface the users liked the prototype and tried to explore it further.

Since users had problems in understanding the interface it was obvious that the interface had to be simplified. To simplify the prototype interface we chose to remove options that users would rarely use. We also fixed consistency problems between windows and interface mechanics.

After testing it with users and analyzing its feedback we created a game prototype. This prototype had the objective to establish if a possibly created game with the platform could be fun while supporting educational content.

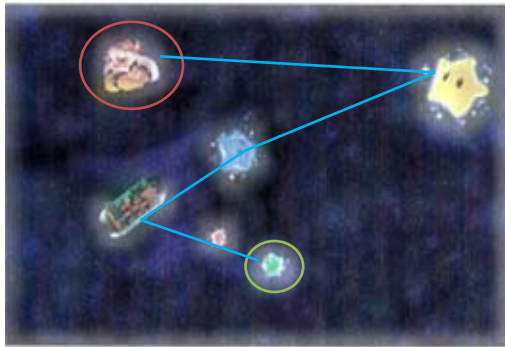


Figure 6 Game Prototype

The game was created using images altered in order to create a board with a path and challenges (Figure 6) as well as characters, comments about the player's performances. We used challenges focusing aspects of Portuguese language.

The evaluation of this prototype was made with a group of five young adult and later with more three young adults individually. The reason for testing in two different ways was that the group

talked and interacted like if it was a party game.

It was not taken any measurement of the player's performance, but notes were taken about the player's feeling towards the game. They were also asked if they liked the game and if they would play it again later. The players had a visible sense of fun and they stated that would play the game later.

With good indications on the Game prototype and the feedback on the first paper prototype we elaborated the second final low-fidelity prototype.

Evaluation of this prototype was done through a set of four experts (collages and persons with experience using and creating interfaces). We also contacted some of the previous users to establish if the changes were working. The evaluation was done by presenting the same tasks to users. The results were good with users comparing the two prototypes and choosing the final as the easiest. After some weeks tweaking the design and improving the game creation process with the help of experts and user interface tests it was ready to create a high fidelity prototype.

The first high-fidelity prototype could not be finished to a meeting held with person from the community of Ciberdúvidas. Testing of this prototype went pretty bad since the users had to be introduced to many concepts but cannot try them at full extend. However some important changes were made, mostly at interface level and the hierarchy of options.

After some months a version with a cleaner and smoother interface was completed and ready to test with the community of Ciberdúvidas. This prototype was tested through a series of conversations using email with a future user of this platform. It revealed that the platform were more difficult to users that we expected. The platform was changed to include integration with Windows, performance tweaks to better provide feedback to users and adaption's of the mechanics interaction.

For last a final high fidelity prototype was made. This prototype was capable of creating word games and featured a reviewed interface. In the followings Figure 7 and Figure 8 we can see a part of such interface.



Figure 7 Board with a path

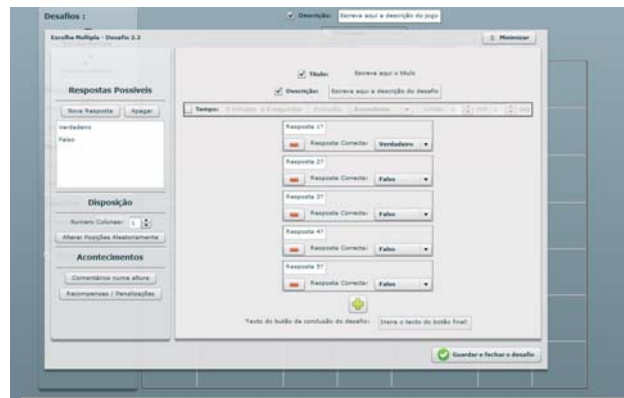


Figure 8 Multiple Choice Example

Evaluation was made with eight users being four of them educators. It was taken notes and a video about the experience. Users were hand-picked and divided in three separate groups – group one is teachers or educators, the second is adults that spend 3-6 hours for week using a computer and finally the last group young adults that use the computer more than 10 hours per week. Also relevant for group 1, is that they spend about 1 to 2 hours a week with the computer and use it mainly for professional tasks.

In the user interface test they were faced with the following eight tasks:

- Create one challenge of multiple choice following an example available
- Create one challenge of matching following an example available
- Creating a path (choosing a starting and ending challenge and creating a link between them)
- Add Time and Score to the game
- Create comments to one of the challenges
- Create rewards and penalties to one of the challenges
- Customize images (character, board background and challenges)
- Save project, create a game and play it

As we can see in the following Figure 10, Figure 9 and Figure 11 the results were very good and motivating.

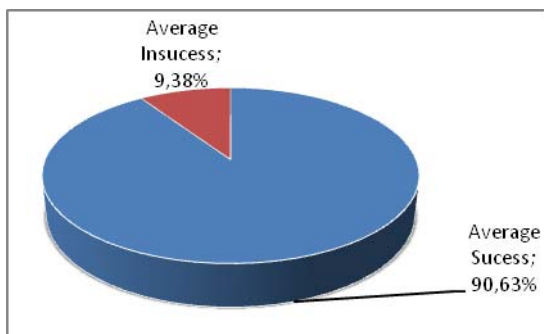


Figure 10 Average Success Rate in performing tasks

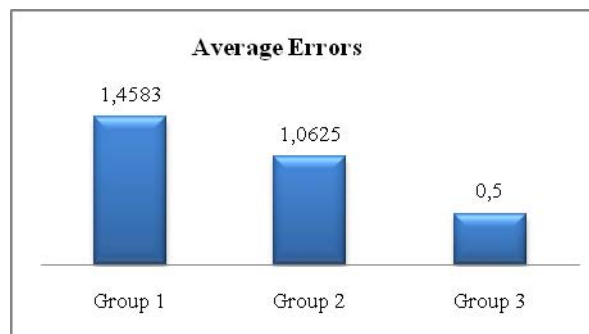


Figure 9 Average Number of Errors made by group of Users throughtout the tasks

There were good results in the average success rate (visible in Figure 10 being over 90% while the number of errors (Figure 9) the average number of mistakes made by the users of target audience (group 1) is 1,5.

In Figure 11, the time taken to complete the tasks was average 06 minutes and 11 seconds by task for the target audience.

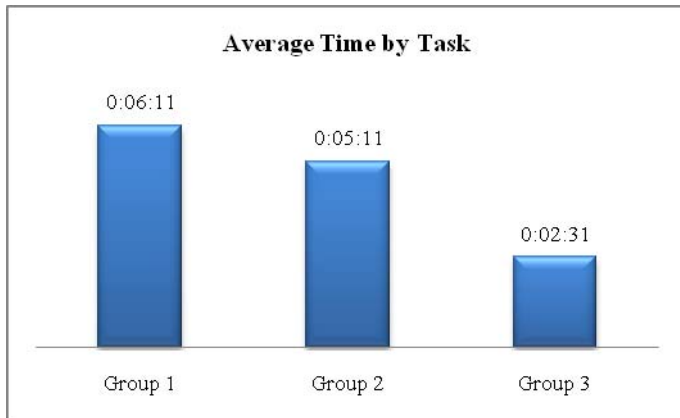


Figure 11 Average Time that each group took to complete one task

Since these tasks are the core of the process and that were the most troubled, indicates that we must review and further work on these tasks.

Users also played the games that they generated and seemed to not be disappointed by the outcome. The overall quality of the generated games was good as we can see the following Figure 12 a screenshot of one of those games.

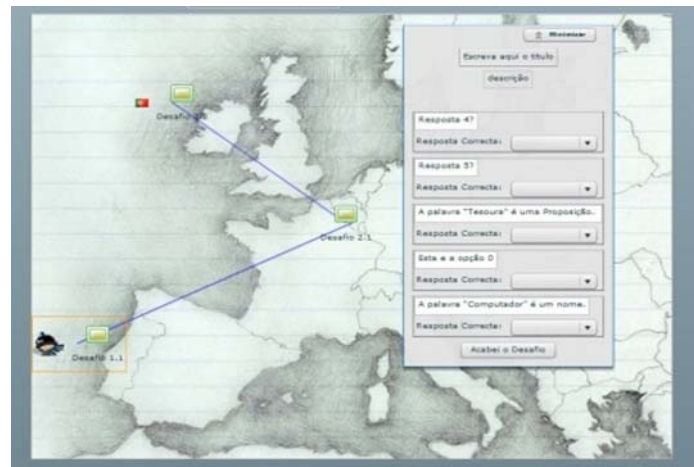


Figure 12 Generated Game Screenshot

5. Conclusions

The preceding sections have discussed the creation of a platform for making word games. They showed many possibilities to create such games and the creation of such a platform was possible. Unlike other platforms LudoPor has enough flexibility to allow anyone to create successful word games.

We started by establishing the reasons for successful word games, the mechanics that make them work this way and being so successful such as Multiple Choice, Matching or Word Forming among others.

It has also been researched about the use of components of the game world identified while researching for successful word games. From that work we made the Conceptual Model. This

model consists in several concepts like the world representation that should be used (the proposed was a Board representation), the player, the challenges, performance indicators and goals. Also it was discussed of how the use of those concepts influences gameplay and players. Creating a game world by the use of a board consists of establishing 6 concepts:

- Establishing the game world representation (dynamic vs. Static boards, number of boards necessary) as well as the size of the board.
- The performance indicators (score, time and the use of items)
- Game goals, establishing the primaries goals (needed to advance in the game), secondary's (to increase motivation on players) and the final goals.
- Challenges, where we have to choose where they should be (forming the base layout of the board), what mechanic does it use and how it is used. The designer must also choose the feedback given to the player and to the game world as well as challenges are adaptive or not.
- Defining the layout of the board, after choosing where the challenge would be, we need to define the links between challenges. Choosing the type of each link (directional, bidirectional or conditional) and how they connect completes the layout of the board
- Finally deciding where the player will start and if applicable where will the player end, as well as defining the player movement, the feedback the game on the player

Finally to demonstrate that the conceptual model and to supply the Ciberduvidas community we constructed a prototype - LudoPor. This prototype was created using an iterate design using user test as drive for evolving the prototype. Also we have been helped by the community of Ciberdúvidas that tested the prototype helping indentifying bugs, problems with the interface or problems with the process of creating games.

The implementation has shown that is possible to make a platform based on the model that works and the results of interface tests were very good. Almost all of our users were able to create games, they also played the games and enjoyed them.

In the future it is planned that this platform could grow to use more concepts present in the conceptual model such as items, different links and goals as well as multiplayer mode to induce the party games that was a reason of success reviewed in the Related Work. Also it was planned the implementation of more mechanics such as Word forming or Fill in the Gaps to support more and different games.

References

- [1] James C. Smith, 2007 ,“Games Sales Charts”, Presented at Casual Connect, Seattle, 17 July. [Online] Available from:
<http://www.casualconnect.org/content/analysis/JamesSmith-7-07.html> [Accessed March 2009].
- [2] Maja & Paul Pivec , 2008, “Games in Schools Report”, Maja & Paul Pivec , [Online] Available from
[http://insight.eun.org/shared/data/pdf/final_literature_review_\(gis\).pdf](http://insight.eun.org/shared/data/pdf/final_literature_review_(gis).pdf) [Accessed March 2009]