COMP 7036
Research Proposal

By Sukhdeep Singh Raikmo

<Student A00 number>

Abstract

A research proposal that entails studying how people play a selected mobile puzzle game. The research wishes to find out how much time will people spend on a selected mobile puzzle game, with various difficulty levels, before giving up. The research also proposes to find out what an analysis of the difference between the time spent and the difficulty of the game reveal about why the individuals who give up, give up after a certain amount of time.

Contents

I. THE PROBLEM AND ITS SETTING

A. The statement of the problem and sub-problems

1. Problem Statement

How much time will people spend on a selected mobile puzzle game, with various difficulty levels, before giving up? What does an analysis of the difference between the time spent and the difficulty of the game reveal about why the individuals who give up, give up after a certain amount of time.

2. Sub-Problems

a. Sub-Problem 1

To analyse the time spent, in game, playing a selected mobile puzzle game with various difficulty levels whilst the game remains installed in order to discover why there are variations in the amount of time is spent.

b. Sub-Problem 2

To analyse the time spent, per level, playing a selected mobile puzzle game with various difficulty levels whilst the game remains installed in order to discover why there are variations in the amount of time is spent.

c. Sub-Problem 3

To determine what an analysis of the first two sub-problems may reveal about how long people will play a selected mobile puzzle game before giving up.

B. The hypotheses

a. Hypothesis 1

The time spent in game, playing a selected mobile puzzle game will decrease when the game's difficulty is increased.

b. Hypothesis 2

The time spent per level, playing a selected mobile puzzle game will decrease as the game's difficulty level is increased.

c. Hypothesis 3

There exists a relationship between the time spent in game and the time spent per level such that as less time is spent on more difficult levels, less time is spent in game. Meaning people will not play easier levels and spend time in game after coming across more difficult levels, they will just give up on the game.

C. The delimitations

This study will be limited to data collected over a 2 month period.

This study will not use data from users who uninstalled the selected mobile puzzle game in less than 2 weeks.

This study will only be based on the data collected from a specific mobile puzzle game.

This study does not aim to find how long people will play all types of puzzle games before giving up. It is limited to a specific mobile puzzle game, and those similar to it.

This study will be limited to finding a relationship between the selected puzzle game's difficulty and how that effects the length of time the game is played.

This study will not be looking into other reasons why people give up playing a game, such as boredom, technical difficulties etc.

D. The definitions of terms

Terms

The selected mobile puzzle game: A game that will run on Android mobile devices which requires the user to solve puzzles. The puzzles to be used will be similar to "unblocking" puzzles or puzzles in the game "flow". Similar puzzle game screenshots can be seen in Appendix A. Since these puzzles are language independent, very little changes will be required to make the game for each of the major languages and countries of the world.

Various difficulty levels: The difficulty levels of the selected mobile puzzle game will be restricted to Medium and Hard. The medium levels will be able to be completed simply by looking at the game. The hard levels will require thinking ahead several steps before being able to complete the puzzle.

Game Analytics: "The use of data generated by players to better understand players' behaviour in the context of a game" (Chong, 2012).

Playtomic: A game analytics tool that can be used to monitor variables such as, but not limited to, time spent in game or time spent per level.

Installed game: An installed game refers to a game which has been installed on a user's device and of which the user has agreed to the terms and conditions/license agreement. A sample license agreement can be seen in Appendix B with a custom clause for this research project.

Adequate user base: At least 400 users have installed the game and used it for more than 2 weeks.

Give up: A user is said to have given up playing the selected mobile puzzle game when, the user uninstalls the game, or logs less than a 1 hour per month of play.

Various countries: A selection of countries where the game will be released, including, Canada, England, USA, India, China, South Korea, Australia, Russia, France, Spain and Brazil.

Abbreviations

Game MP is the abbreviation used to describe the selected mobile puzzle game being used in the research.

E. The assumptions

a. Assumption 1

Game MP has been created by the researcher and/or the researcher's team.

b. Assumption 2

Game MP has been released onto the Android market and shown that it can acquire an adequate user base.

c. Assumption 3

At least 70% of users that play Game MP will give up within 2 months of installing the game.

F. The importance of the study

Mobile gaming has exploded in recent years, and little is publicly known about how much time players spend on games similar to Game MP, before giving up. Little is also known about how the difficulty of such games affects the amount of time users spend playing them. Conducting this research will shed light on how long users spend on such games before giving up and if the difficulty is a factor. The benefits of conducting this research are that developers making games which are similar to Game MP will know how much time they have to fine tune their games before users give up. This will enable developers of such games to make changes within a known amount of time and may help them keep their users for a longer time.

II. THE REVIEW OF THE RELATED LITERATURE

The literature review will include 3 areas: (a) a look at the video game industry specifically the mobile market, (b) a look at how much time people are spending playing video games, and (c) the different kinds of puzzle games and the effects difficulty can have.

A. The Video Game Industry

The video game industry has grown not only in its monetary value but across to multiple devices such as phones, tablets and TVs. Games are played more often than they used to be as they have become more and more accessible over the years. Players are no longer limited to a console which can be heavy to carry around; they can now carry games on smaller devices. In less than 40 years games have gone from simple bouncing block games such as pong to the Mass Multiplayer Online Role Playing Games and more. By 2006 the US video game industry had made $12.5 billion (Wolf, 2008, p.1). Wolf also states that research studies into video games are mostly being done on newer games. The view that Wolf has about the gaming industry is that "[v]ideo games have [had] a growing influence on other media like film, television, and the Internet and are played by hundreds of millions worldwide" (Wolf, 20081 p.1). There is no denying what Wolf says about the industry in that it has exploded worldwide. I disagree with Wolf that research is mostly being done into newer video games, I have found little evidence to support his claim, since much research can be found on early games such as pong, pac-man, space invaders and the like. In contrast to Wolf's beliefs, I have found that there is very little research into newer video games, especially mobile gaming, with the exception of Angry Birds and a few other viral sensations. The Android platform that Game MP is to be written for has also exploded over the recent years. Google has reported in June of 2012 that there have now been 400 million Android Activations, 600 000 apps in their app store and 20 Billion downloads. These figures suggest that Android will be a good platform to carry out our research study.

B. Time Spent Playing Video Games

It is widely accepted that much of the time spent on mobile devices, other than for calling, is spent playing games, however there has been little research done to support this claim. A related study which looked into the time spent playing video games was carried out by Phillips et al in 1995. The study was only based on 816, 11-16 year olds and is fairly dated, but the data can still help paint a picture of how much time was being spent on video games. Of the children questioned it was found that 77.2% played between a half hour and one hour per day (Phillips et al, 1995). I agree with Phillips et al's conclusion and if we consider an upward trend due to the ease of access to video games over the years, as stated in the earlier section, we can safely assume that 77.2% 11 – 16 year olds are spending at least an hour per day on some sort of video games. Other than this there has been little research into how long players spend on mobile gaming, and little to no research on how long players are spending in game or per level in specific games. Since there is no commonly or widely accepted measurement tool in use for these characteristics I will choose a tool that can accurately measure these characteristics when carrying out my research.

C. Puzzle Games and Difficulty

Puzzle games are challenging, this is why people play them, and although it has been widely accepted that increasing difficulty will lead to less players and therefore less money, I do not yet

agree due to lack of evidence. Scott Rogers has done some writing on puzzle games and has spoken of how making a puzzle game too difficult will lead to gamers becoming unhappy and the developer losing their business (Rogers, 2012). Although I would like to agree with Rogers, he does not have any evidence to support this claim. Therefore, in my research proposal I plan on finding out if difficulty is a factor in the amount of time people spend on a particular type of puzzle game.

III. THE DATA AND THE TREATMENT OF THE DATA

A. The data needed and the means for obtaining the data

The data required for this research study is the time spent playing Game MP on its various difficulty settings, per level. The data required is from the estimated 70% of users that will give up playing the game. Data from those that continue to play the game past the 2 month window without giving up will be treated as extraneous and not to be used in this research study. The means for obtaining this data are already part of Game MP. Game MP will have Playtomic game analytics integrated into it. The data required will be transmitted from players around to the world to the Playtomic servers for the researcher to collect. The ethical consideration of gathering data from players has also been dealt with via the license agreement that the players must sign before installing the game. The agreement states clearly the research being done and that those wishing to take part can install this game.

B. The research methodology

The study is intended to uncover how long people play Game MP and similar mobile puzzle games before giving up. The study also wishes to find out if increases in difficulty have an effect on how much time is spent playing these mobile puzzle games.

Sample

The sample will be a probability sample using cluster sampling divided across the various countries the game has been released in. For this study, a minimum sample size of 400 adequate users is required. The population consists of people who play game similar to Game MP. Games similar to Game MP, such as “flow” and “unblock” have a range of user numbers from the thousand to the few millions. This study will estimate that the population consists of approximately 1 million users. Using this number a representative sample of the population would be 384 users, we will round up to 400.

Instrumentation

This study will establish its own use of an instrumentation tool since there has been no similar study to follow from and no widely accepted measurement tool. In this study Playtomic game analytics will be used to measure the time spent in game, per difficulty and the time spent per level, per difficulty. Playtomic is a measurement tool with high validity as it is made to measure game variables and does just that. The reliability of Playtomic is fairly high but it is affected by latency to the server and may not get the exact time correct every time. The reason for picking Playtomic over other game analytics tools such as Flurry is that Playtomic seems to be popular with many game developers and a basic membership is free. Playtomic also has a large user base and adequate tutorials for integration on the internet.

Collection

The collection of data and means has already been discussed in part A of this section.

C. The specific treatment of the data for each sub-problem

1. Sub-problem l

To analyse the time spent, in game, playing a selected mobile puzzle game with various difficulty levels whilst the game remains installed in order to discover why there are variations in the amount of time is spent.

a. The data needed to address the sub-problem

The data needed for this sub problem is the values associated with total time spent in game for Game MP. The data should be separated based on the difficulty level being played at e.g. total in game time on medium, total in game time on hard. The time spent values will be a sum from the start of the installation to the point where a user gives up.

b. The treatment of the data

This study will calculate the mean of the data collected in order to get the average amount of time per difficulty setting, that a user spends playing Game MP before giving up.

The mode will also be calculated to know the most occurring time at which players give up per difficulty setting.

The correlation coefficient between the time spent on medium difficulty and the time spent on hard difficulty before giving up will be calculated. This will indicate if there is a relationship between the difficulty and the time spent before giving up.

2. Sub-problem 2

To analyse the time spent, per level, playing a selected mobile puzzle game with various difficulty levels whilst the game remains installed in order to discover why there are variations in the amount of time is spent.

a. The data needed to address the sub-problem

The data needed for this sub problem is the values associated with total time spent per level for Game MP. The data should be separated based on the difficulty level being played at e.g. time per level on medium, time per level on hard. The time spent values will be a sum from the start of the installation to the point where a user gives up.

b. The treatment of the data

This study will calculate the mean of the data collected in order to get the average amount of time per level, per difficulty setting, that a user spends playing Game MP before giving up. This will provide a more granular view on where and when a user began to give up.

The mode will also be calculated to know the most occurring time in a level, at which players give up, per difficulty setting.

3. Sub-problem 3

To determine what an analysis of the first two sub-problems may reveal about how long people will play a selected mobile puzzle game before giving up.

a. The data needed to address the sub-problem

The data needed for this sub problem is a collection of the data from sub problems 1 and 2.

b. The treatment of the data

This study will compare the average time spent per level per difficulty with the average time spent in game per difficulty and determine if earlier, easier levels were played for longer than later more difficult levels. If this is the case then people who came across the harder levels just decided to quit playing. If the later levels were played for a similar or longer time then the difficulty may not be related to whether or not a player will give up.

IV. THE QUALIFICATIONS OF THE RESEARCHER AND ANY ASSISTANTS

The research will be conducted by Sukhdeep Singh Raikmo, alone. The researcher is a computer/games programmer and has experience writing games for the mobile platform. Since this project requires a fully functioning puzzle game for Android, with Playtomic integrated into it, the researcher who has the skills to accomplish this task will be able to do this aspect. The rest of the research requires an evaluation and interpretation of the data that has been collected. The researcher also has experience in doing this from his marketing and practical research courses.

V. AN OUTLINE OF THE PROPOSED STUDY

A. Outline

The study plans to find out how much time will people spend on a selected mobile puzzle game, with various difficulty levels, before giving up? The study also wishes to know what an analysis of the difference between the time spent and the difficulty of the game reveal about why the individuals who give up, give up after a certain amount of time.

B. Steps

The steps to be taken are as follows:

Step 1: Release Game MP on to the Android market. (It is assumed that Game MP has already been trailed and shown it can gather adequate users)

Step 2: Monitor and gather the required data over a 2 month period.

Step 3: Analyse the data as stated in Section III under treatment of the data.

Step 4: Interpret the analysed data to see whether there is enough evidence to reject the null hypotheses and accept the research hypotheses.

Step 5: Write down the findings and conclusions.

C. Timeline

Week #	1	2 - 9	10	11	12
	Step 1	Step 2	Step 3	Step 4	Step 5

VI. REFERENCES

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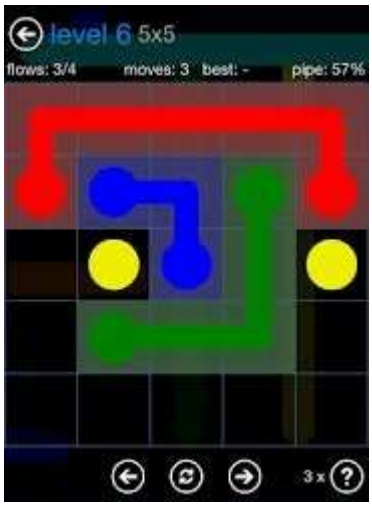
Rogers, Scott. (2012). Swipe this!: the guide to great tablet game design. [Books24x7 version] Retrieved from http://0-common.books24x7.com.innopac.lib.bcit.ca/toc.aspx?bookid=46236

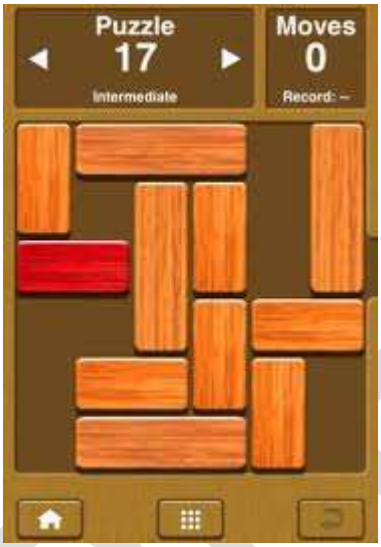
Wolf, Mark J. P. (2008). *Video Game Explosion, The: A History from PONG to PlayStation and Beyond*. Greenwood Publishing Group. Retrieved 10 December 2012, from http://lib.myilibrary.com?ID=120350

VII. APPENDICES

A. Appendix A



A screenshot of the mobile puzzle game flow



A screenshot of the mobile puzzle game unblock me

B. Appendix B

END-USER LICENSE AGREEMENT FOR {INSERT PRODUCT NAME} IMPORTANT PLEASE READ THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT CAREFULLY BEFORE CONTINUING WITH THIS PROGRAM INSTALL: {INSERT COMPANY NAME's } End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and {INSERT COMPANY NAME}. for the {INSERT COMPANY NAME} software product(s) identified above which may include associated software components, media, printed materials, and "online" or electronic documentation ("SOFTWARE PRODUCT"). By installing, copying, or otherwise using the SOFTWARE PRODUCT, you agree to be bound by the terms of this EULA. This license agreement represents the entire agreement concerning the program between you and {INSERT COMPANY NAME}, (referred to as "licenser"), and it supersedes any prior proposal, representation, or understanding between the parties. If you do not agree to the terms of this EULA, do not install or use the SOFTWARE PRODUCT.

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7. Custom Clause for Research Project

By installing this software onto your device you agree to take part in a research project involving time spent playing puzzle games. You agree to allow the software to transmit data collected on aspects of how you play, e.g. time spent per level, and time spent in game etc.