



ISSN: 2617-2070 (Print) ; 2617-2070 (Online)

Journal of Advanced Sciences and Engineering Technologies

available online at: <http://www.isnra.com/ojs/index.php/JASET/>Journal of Advanced
Sciences and Eng.
Technologies**JASET**

Mohammad Al Ansari

**Kingdom of Saudi Arabia Ministry
of Education, Northern Border
University, Faculty of Computing
and Information Technology**

Keywords:

Game development process
Software Game
Software Process.

ARTICLE INFO**Article history:**

Received 01 April 2018
Accepted 20 April 2018
Available online ..may 2018

DOI:

<https://doi.org/10.32441/jas1et.v1i>

Development life cycle of the games through software engineering

A B S T R A C T

The games in our time are the main factor in the world of entertainment and it does not depend on young children, but also enjoyed by the elderly and also have the ability to influence their behavior, which leads to new ideas and strategies that affect the positive character of the game .,, But also are used for serious purposes and can be launched on various areas such as health care and education. We will try to highlight software development in the game development process and will try to bridge the gap between the software developments processes used to develop the games.

© 2018 JASET, International Scholars and Researchers Association

Introduction

The game industry is witnessing unprecedented growth and this development is being done by inventing innovative new ideas through the developer of the game. There will be designs and developments for the games, The development of the game is a process of creative activity needs to evolve continuously and therefore it is difficult for the developer to adhere to a fixed life cycle of the game, but needs to develop ideas and we will discuss here how to develop the games „through their life cycle that can adapt to the changing needs of the user who uses these games .

The establishment of the Games is a complex task that involves the experience of many skilled engineers with experience in the fields of computer science, media and business games. These games are usually developed in a very short period of time. All stages of the life cycle of the games are carried out in a short time, Powerful to design their own games The games have been defined by Zimmerman is a software application one or more of the players who can make decisions by controlling the games and resources in the pursuit of the desired goal and the games software is the programmed applications that are fixed Such as video games, computers and

portable devices, and the game industry is the creative industry all over the world .

The game development life cycle consists of several different stages, similar to the stages of software development. These stages are influenced by a number of different factors, the most The game industry is witnessing unprecedented growth and this development is being done by inventing innovative new ideas through the developer of the game. There will be designs and developments for the games, The development of the game is a process of creative activity needs to evolve continuously and therefore it is difficult for the developer to adhere to a fixed life cycle of the game, but needs to develop ideas and we will discuss here how to develop the games „through their life cycle that can adapt to the changing needs of the user who uses these games .

The establishment of the Games is a complex task that involves the experience of many skilled engineers with experience in the fields of computer science, media and business games. These games are usually developed in a very short period of times

Approach:

In the world of game software development, computer games are considered to be fun games, but they are not only used for recreation but also have serious purposes that can be applied in many other areas such as health care and education. Serious games are designed to have an impact on the target audience, They are combined for the positive effect on the user . Both have to be attractive and appealing to a broad target audience (Alvarez & Michaud, 2008). Especially for the serious games that have started to increase their revenue in different areas and these games have achieved revenues more than three times that of any other program .

The over-arching phases of game development according to [2] are preproduction, production, and testing (Charged to it as a post-production phase).

The production of the game must be preceded by a preview of the game and the game design document is built before the pre-production phase. The game document design must be completed and updated during the stages of the game. In this stage the game is given to the developers and designers of the game

to activate some models in order to create fun or element This game will affect the final stage of the game, which will affect the production of the game and this stage will affect the majority of the assets, which include the symbols of the software. This is the time that leads to the production stage, and the developers can create prototypes, It is these changes that cause a number of changes in the initial models. However, these drastic changes that are poorly managed can cause widespread problems affecting jobs, resources and much more.

The final phase is a test phase and includes the test of the game under the conditions of the game and not only the search for errors or defects and one of the players experience the game under the conditions of the game to the maximum degree under pressure test or the test of endurance and the stages are tested in terms of complexity .

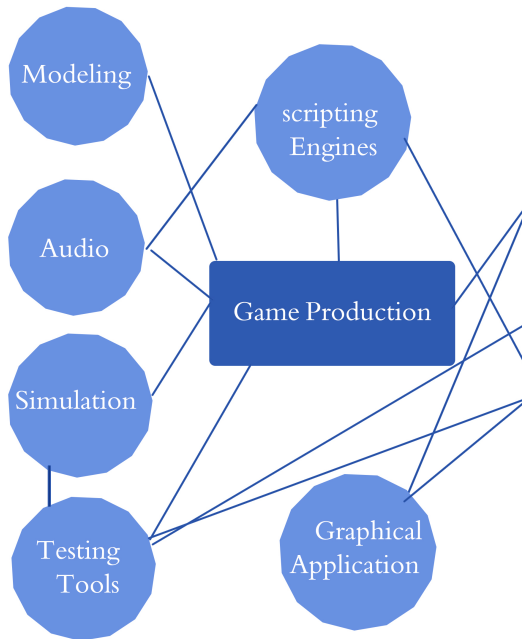
Game development roles

There are eight principal sectors in which the game development teams can be divided:

- 1_ Design parts
- 2_ Coding parts
- 3_ Art parts
- 4_ Audio parts
- 5_ Management parts
- 6_ Quality Assurance parts
- 7_ Business parts
- 8_ manufacturing parts

Designers are the important responsibility to create a game idea is important and funny and the designer is the only person able to modify the original concept according to the constraints of money and time and there are also levels of dialogues and designers to create a game more exciting suitable for the game and the function of the programmer is to implement all the instructions necessary to run the game (3D engine , AI2 programming and tools. At the same time, all players in the game design are respected by sound experts and artists who put great effort into creating more excitement, textures and sound effects. The project management is the most effective and important element. Coordinate all steps of work and resources and reconcile correspondence between artifacts and team members .

The executive producer sector must include a solution to all the strategic issues of the company. The crucial part of the life of the video games is conducted and before the testing of the program is fully tested, the beta stage is composed by the volunteers who play an important role in reporting the case, if any. Video games in the form in Figure 1 .



Game development process Figure (1)

Game development life cycle :

At the beginning of this stage a small group of people will exchange ideas to get a new or innovative game idea and after the meeting and discussion create a document the concept of this document will be a small but brief description of the detailed video game

1 - Pre production stage

In this stage, four things will be produced. These things are very important. These things are the game

design document, the technical design document, the project plan for the work, and the first model of the game, and a great effort is put to create the final design document and the game design document when it is 100% The game has officially started and should define the technical design document and the programming languages that will be used will be defined , such as C#, C++, SQL3, UnrealScript4, and should decide which components for the game may be reused from existing software or be licensed from third parties [3]. The game design document and/or the technical design document may identify areas of the game that are likely to undergo significant change during the development of the game.

At this stage, managers or team leaders have a great responsibility to make critical decisions that affect the success of the game and focus more on fun and sacrificing part of the business or alternatively test part of the work and sacrificing the desire of the customers In the pre-production stage, engineers try to identify the problems before Start developing the game and try to address, reduce and eliminate it before it causes the failure of development efforts and the failure of the game and when a problem appears in the development process can be analyzed risk and damage to reduce them

2 - Development.

In the beginning, the experience and qualifications are playing a big role in the whole system of the game and this gives a great opportunity to try to divide the work between them and provide a distinctive work and be an experience for programmers and therefore to raise the level of developers to produce the best games and the game design document is all technical areas and in many cases Use UML schemas in the initial steps. Use case diagrams, for example, illustrate the game design document and the behavior of the various subsystems in the game [4]. The use of charts as raw materials to develop the fixed design of the game program and also there are more requirements that must be available in the game to meet the needs that do not interact with the player and called these invisible requirements and these requirements are not visible in the game model is security and database management and synchronization between topics Geometric software that works to help developers write code faster, save time, correctly and error free, and have design patterns and documentation are good practices but

for small projects that can be dangerous [5]. If the small team that spends a lot of time for analysis, documentation, planning and programming there must be sufficient time for the coding process which will postpone all the dates of the issuance, which will lead to customer dissatisfaction

3 - Alpha/Beta/Code Freeze.

The planning is to ensure the quality of the product and free of defects in order to ensure new technology during each process through development and the team must choose to estimate the number of defects in order not to waste time to test areas of the game to ensure that it is free of defects must be the most important component of the quality assurance plan is Express the goal clearly and the goal of measurable quality, which must be checked in the game before they are ready to put them in the markets and all games and all programs free of germ and to ensure the quality of the product must be just a test and the game forever until the person feels enough pressure to ship the Game After installing alpha and beta, the code is blocked so it is not allowed to make further modifications .

4 - Release to Manufacture

This is the real time to go to manufacturing in order to get money because when the game is released some gains must be spent money in a very early time and this is a stage that is closely related to development because when you create a video game it is the work of someone who sees a profit person spends The money to make that profit and spur the profits to cover at least expenses make the game not a simple adventure and its profits are not so few and so the money is great for developers and publishers [3]. But we have a problem here is the designers' expectations are that they can fail to meet their financial expectations because developers can fail to express clearly and involve their expectations and knowledge of financial projections is the only way to achieve success and profits through the game project but it is not necessary to point to the high gains and make a plan A good project even though not very large can help to make a living instantly

from the start up to make improvements to the future

5 - Patch/Upgrade. Finally,

After the game is released, the work is not over and there is a specialized team whose sole function is to maintain the safety of the game in terms of marketing and maintaining the game means correcting and releasing some bugs and introducing new employees in the game or giving the customers a chance to ensure the safety of the game and achieve sufficient profits in the market .

The research process used has been taken from the guidelines set out by Kitchenham and Charters [6] for performing SLRs in software engineering, and the researcher (as a single researcher) has undertaken the 'light' version of the review guidelines. The 3 phases of the review and the steps associated with each phase are shown in figure 2.

Phase 1: Planning phase

This study started by selecting a topic, at which point the study objectives were also Clearly defined and the boundaries of the domain delineated.

Selecting a topic for SLR is of crucial importance because many factors such as individual or Community interest, research gaps, and research impact contribute to shaping research questions on the topic. Our understanding of the GDSE process life cycle is continuously evolving

(Kitchen ham et al., 2010), and many areas in this field lack generalized evidence. It is critically Important for the game industry to identify a quality-driven GDSE process. Several studies Have investigated different phases of the GDSE process life cycle, but they do not offer systematic, Comprehensive and thorough methodological research specific to this topic

In this review, studies from 2000 to 2015 will be explored to answer the following research

Questions:

Research Question (RQ1): What is the intensity of research activity on the GDSE

Process life cycle?

RQ2: What topics are being researched in the pre-production, production, and postproduction

Phases?

RQ3: What research approaches are being used by researchers in the software game

Domain?

RQ4: What empirical research methods are being used in the software game domain?

The number of publications has been identified by the research group to address

RQ1. A graphical representation has been used to represent the increase or decrease in the number of publications per year as a measure of research activity. To address RQ2,

RQ3, and RQ4, each study selected has been affiliated to a research topic, to a certain approach, and to a specific methodology used for the research

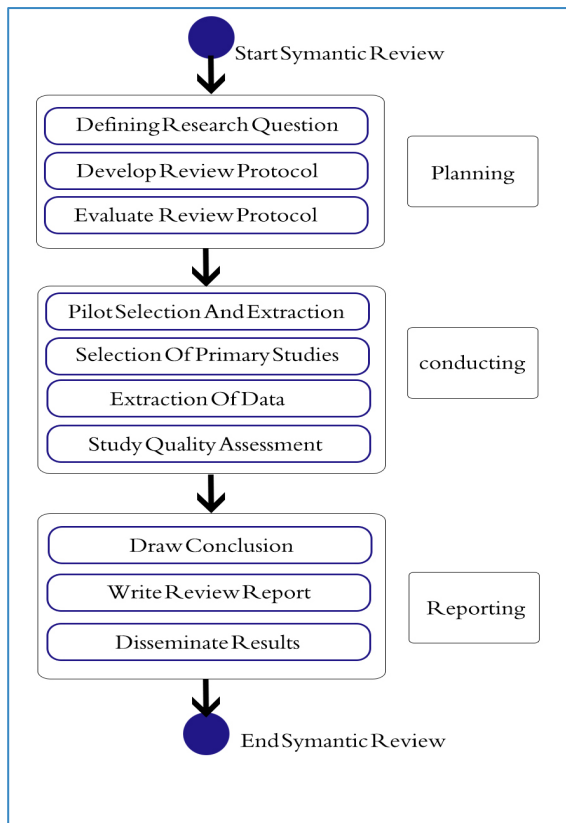


Figure (2) : SLR steps

Phase 2: Conduct the Review, Search Strategy (Step 5)

The search strategy for SLR is a plan to build search terms by determining the number of population, inputs and outputs. The terms are combined to create a different set of research groups. Each set of terms is composed of different forms of the same words Or terms that have no meaning, significance or relevance between the scope and table 1 shows

and in order to retrieve a collection of related literature and four groups are designed.

The search strategy was implemented by applying the “AND” and “OR”, where the “OR” operator is used within the Group and the “AND” is used between the groups.

According to Table 1, the following search string will capture the structure:

Group 1	Group 2	Group 3	Group 4
[Software game] [OR Digital game OR] Video game] OR] Computer game] OR [Online Game] [OR [Serious games OR [Educational Games] OR [Learning ([Games	[Development] OR [Advancement] [OR [Steps [OR [Evolve ([OR [Project	Life cycle] OR] Design] OR] [Implementation] OR Requirements] [Engineering [OR [Testing [OR [Evaluation ([OR [Maintenance	Process] OR [Progression] OR [Method] .[OR [Model

Table (1) : Search Strategy

Therefore, “Software game development lifecycle process”, “Computer game development Design process” and “video game testing process” are some examples of the search strings and Similar way different search strings were formed in order to capture all relevant studies.”

To ensure that all relevant research concerning this area of study was reviewed,

Journals and conferences from 2000 to 2015 were covered, using as sources IEEE

The topics have been classified in the life cycle of GDSE. This section contains many topics covered and studied in relation to the pre-production process. There are also the post-production issues involved. There is a classification system which was used in the adoption of a classification by several magazines and conferences that discuss engineering topics The same classification was used to classify the papers under study.

Documenting (Step 10–12)

Here at this stage of the SLR is a stage of the description of the conclusion and potential threats that will threaten the validity of the results and the authors believe that there is a great opportunity for the word game because they did not exist before in some studies have never before discussed the word game in the research and was thus excluded These

studies from the initial data set are conducted through research and there are also other related threats associated with a systematic review of the literature such as generalization and self-evaluation .

There are also limitations on the results, although there are large amounts of time and effort spent on such tests, which were mentioned in the study. This research was limited to academic databases. It is clear from the results that developers prefer to submit their work on blogs or forums. The posts for the game forums and other blogs are not guaranteed to review the methodological literature of the game because it does not meet the quality standards used in the use of the game

. In addition, exclusion of less-known journals and conferences from the Web of Science and the Scopus index might have led to a different dataset. Another limitation of the study is the exclusion of Human-Computer Interaction (HCI) filed studies. In the phase of screening out, we found studies from HCI field such as (Pass -Oude Boss et al. (2010)) for games but they didn't focus on software engineering perspective. In short, we didn't consider studies from HCI because they take nonfunctional requirements, and usability features into account. These methods help developers to evaluate software and they considered as an integral part of game development. However, due to the limited scope of the study, we excluded studies from HCI field.

Results:

This paper describes the various topics in the GDSE field and highlights the major research activities related to the life cycle of software engineering. The research topics identified by GDSE are a different mix of software engineering disciplines and are the completion of the game development process.

The GDSE have proved that the process is incredibly difficult as in game technology including game platforms and change engines are used very quickly and we use coding modules in any new game project. However, the success of any game for the digital games industry assumes more pressure along with the development challenges The game also highlights the need to adopt the new practices of the game development process and to know the field of software development and improve the process of improving the software engineering and to evaluate the activities needed to perform However there

were no strategies or a set of best practices to implement the development of the game. This systematic literature review helps to identify the research gaps in game development life cycle.

The main objective of this research is to provide an overview of the GDSE process Life cycle because in the past researchers differ from the traditional software development process and to achieve this goal is a systematic review of literature, emphasizing the evidence-based model. The results confirmed that the GDSE life cycle domain differs from traditional software engineering development and that research activity is growing rapidly day after day, More researchers are interested in the observations and have been presented as evidence of the development they are looking for in the search for activities that attract researchers, led by the software development process

. This paper describes the various topics in the GDSE domain and highlights the main research activities related to the GDSE process life cycle. The research topics identified in the GDSE were a combination of different disciplines and together they complete the game development

Process.

References

- [1] <http://game.ezinemark.com/the-life-cycle-of-a-game-7d2d85a67203.html> .[]
- [2] . Kanode, C. M. & Haddad, H. M. Software Engineering Challenges in Game Development. Information Technology: New Generations, 2009. ITNG '09. Sixth International Conference on, 27-29 April 2009 2009. 260-265.
- [3]. Al Smadi, Takialddin. "Design 3-D ultrasonic spatial mouse using microprocessor system." *Journal of Information and Optimization Sciences* 31.5 (2010): 955-971.
- [4]. P. McCarthy. Software engineering and game development. University of Wisconsin-Platteville.
- [5]. Al-Maitah, Mohammed, Takialddin A. Al Smadi, and Hani Qasem Rashrash Al-Zoubi. "Scalable User Interface." *Research Journal of Applied Sciences, Engineering and Technology* 7.16 (2014): 3273-3279.
- [6]. Kitchenham, B.A., Charters, S.: Guidelines for performing Systematic Literature Reviews

- in Software Engineering V 2.3. School of Computer Science and Mathematics Keele University, Department of Computer Science University of Durham, (2007)
- [7]. Evidence Based Software Engineering (EBSE), <http://www.dur.ac.uk/ebse/>
- [8]. Unterkalmsteiner, M., Gorschek, T., Islam, A.K.M.M., Chow Kian, C., Permadi, R.B., Feldt, R.: Evaluation and Measurement of Software Process Improvement—A Systematic Literature Review. *Software Engineering, IEEE Transactions on* 38, 398-424 (2012)
- [9] Aleem S, Capretz LF, Ahmed F (2016a) Critical Success Factors to Improve the Game Development Process from a Developer's Perspective. *J Comput Sci Technol* 31(5):925-950
- [10] Ampatzoglou A, Stamelos I (2010) Software engineering research for computer games: a systematic review. *J Inf Softw Technol Elsevier* 52(9):888-901.
- [11]. - Boyle EA, Connolly TM, Hainey T, Boyle JM (2012) Engagement in digital entertainment games: A systematic review. *Comput Hum Behav* 28:771-780
- [12]. Connolly TM, Boyle EA, MacArthur E, Hainey T, Boyle JM (2012) A systematic literature review of empirical evidence on computer games and serious games. *Comput Educ* 59:661-686
- [13]. Osbourne-O'Hagan A, Coleman G, O'Connor RV (2014) Software development processes for games: a systematic literature review. In: 21st European Conference on Systems, Software and Services Process Improvement EuroSPI, Luxembourg, 25-27 June 2014
- [14]. Cooper, K.M.L., Longstreet, C.S.: Towards model-driven game engineering for serious educational games: Tailored use cases for game requirements. In: *Computer Games (CGAMES)*, 2012 17th International Conference on, pp. 208-212. (2012)
- [15]. Ampatzoglou, A. & Stamelos, I. 2010. Software engineering research for computer games: A systematic review. *Information and Software Technology*, 52, 888-901.
- [16]. O'Connor, R., Using grounded theory coding mechanisms to analyze case study and focus group data in the context of software process research, in Mora, M., Gelman, O., Steenkamp, A. and Raisinghani M. (Eds), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems*, Chapter 13, IGI Global, pp. 1627-1645, 2012.