The Use of Board Games as Learning Media of Project Time Management

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Abstract
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Project time management is the ability of person to use time resources in the project to accomplish a goal efficiently. By the proper project time management, anyone can finish their jobs in the project on time. Unfortunately awareness of the importance of project time management is still lacking and not used to its full potential. Due to not using project time management properly, there are lot of delay and incomplete projects. The purpose of this research is to create a board game as media to teach peoples of the importance of project time management. This study used a mixed research approach by collecting data from the 30 college students and three companies working in game industry. Those collected datas were made into a board game named Days to Deadline that would later be used as media of instruction of project time management. By using a board game as media of time management learning, people who played the board game can learn while experiencing some fun in playing. As a result, awareness and knowledge of the importance of project time management can be perceived by the target of research. From this point, we can draw a conclusion that the board game can be used effectively to teach about the importance of good time management.

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INTRODUCTION

Nearly every job or task in the project must have a deadline or a time limit. Without that system, a project or a given task would not be completed on time. While the work is not completed on time, it can also be disadvantageous for yourself or any other person involved in the project. For a completion of the project, the task or the job must be completed on time; to make it happen a time limit or deadline is needed in order for other jobs can be done appropriately.

Time management is planning, organizing, moving, and monitoring time productivity. Time management aims at productivity which means the ratio of output and input. This management may be looks and feels like wasting time by following the functions of management in managing the time. Planning in advance of how to use the time is not a waste but provides guidance and direction and even supervision over time (Aryani, 2016: 3).

In managing a project, the ability to manage the time is very important. Someone who can do time management well, will be able to complete the work more efficiently and effectively. Time management in a project is usually called project time management. Good time management is essential to overcome the stresses of the modern world without experiencing too much stress (Gea, 2014: 779-780). The better the time management will increase the effectiveness of the work. Conversely, the worse the time management will reduce the effectiveness of work. Employees with good time management will behave, and act on things that take more time for activities that really benefit themselves and their companies. Therefore, employees can achieve the effectiveness of work well (Kholisa, 2012: 58).

Thus, it is important for a person to understand and apply time management to every project he/she does. There are many other benefits gained from project time management. In addition to making the work complete on time, good time management can avoid the collision of time between one job to another and so give a spare time to do another activity like hobbies. To be able to use project time management well, the understanding and awareness to manage the correct time should be applied. Understanding and awareness is very important in the work and must be understood by people who will enter into the world of work that one of them is a college student. Unfortunately, good time management is still not being used well by the general public, especially college students and those who are already working.

Lack of understanding of time management on students can be seen from the results of a survey conducted onto 30 college students from Salatiga town, more than 80% of students have experienced difficulties in completing tasks or work within deadlines. The problem could because students who do not sleep when the deadline is approaching or even late, despite having to sacrifice time for sleep. Similar problems are also experienced by some people who work in the field of game developers.

The data obtained through interviews from three game developers who stood in Indonesia, the three companies said they had experienced delays in reaching the deadline. This is because most people who have been late for work did not know how to manage time or know but ignore it. While, some people who know how to manage the time but have less awareness of the importance of time management, so they neglected and did not use it while doing their task or job.

When a person manages the time, the activity or work performed needs to be categorized first according to their priority. Based on Eisenhower's Decision Principle which Steven R Covey commissioned, there are two categories of activities. The activity is divided into important and urgent. To distinguish that important and urgent is a different matter. Important is not always urgent, yet urgent is not always important. According to Steven R Covey, there are four priority management concepts. The four priorities are: (1) Important and urgent. (2)

Important and not urgent. (3) Not important and urgent. (4) Not important and not urgent. These four concepts can be used to help a person differentiate between important and unimportant work with urgent and non-urgent work (Covey, 2004: 168).

The basis why using college students as the target of testing and data collection is, when a person has become a student, the understanding of time management must be immediately applied. Almost every activity and work must be done in a planned manner by the students themselves. Unlike the other students (elementary, junior and senior high school) whose daily activities such as study and rest are arranged mostly by the school, the college student must decide for him/herself the schedule of study, when to do their tasks and when have time to rest and which work to do first. All these things are almost identical to the world of work where a person or a group of people gets a task or a project. In addition, training and understanding about time management will be very useful for college students when they work on their project as a student or as an employee. Therefore, an understanding of the importance of good time management should be immediately applied.

The correct way to use project time management is required and is common in the world of work and one of them definitely in game developers. In this study, game developers are only used as the theme of the board game created. In addition, according to a website called Creative Set Skill, almost every job role in game developers is required to manage time in every job and must be able to work with others. Game developers employees are also required to complete each job on time, so that other job roles can work on their part smoothly. By all means, using game developers as a theme is considered suitable to simulate project time management to students.

Learning media or learning materials are specific objects used for learning purposes that affect student learning activities. The learning media can be text, visual, video,

Manipulatives and people (Smaldino, 2011: 7-8). The learning media has various ways to convey the message. They can be visual, auditory and kinesthetic (touchable). The game board itself covers all of these aspects where players from a board game will see the game, hear the conversations of their fellow players and touch the game itself.

In general, learning media has the purpose to clarify the presentation of the message so not to be too verbal (in the form of words written or spoken), and able to overcome the limitations of space, time, sensory power, such as objects that are too large can be replaced with images or models, which are too vast to be visualized in the form of film or pictures (Setyanugrah, 2017: 63). One of the kinds of media is a board game. The use of board game as a learning media for project time management is because someone can play while he/she is resting and as a tired-reliever after work. In addition the media game is considered more effective because the game is an act that contains preoccupation and done it themselves (Yunita, 2013: 78). The use of games is also considered suitable, because it is expected to reduce the boredom and reduce the stress levels when learning or working. With low levels of stress and boredom in work, the effectiveness of learning or work can be improved. Using games as a media of learning is considered effective, because humans also prefer to play than learning.

Board games are one of the table top game types. Table top game is games that are played on the table or other flat surface. Game board itself is a type of game where tools or parts of a game are placed or moved on a marked or divided surface according to a set of rules (Jamal, 2015: 77). In Indonesia, the development of board game has started to grow and can be seen from the emergence of board game communities and some board game made by Indonesian developers.

Days to Deadline: Game-Dev Edition is a board game used to learn the importance of project time management and is created by

simulating players as game developers. By simulating the activities that exist in the game developer, players must play as a game designer, a game artist and a game programmer. Each player will attempt to complete the game in a deadline with specified time limit. In order to complete the game, the player must be able to manage their activities on each card and adjust to other player work. Each work should be arrange by each player and adjusted to several other factors, such as stress levels and in-game work-time limits.

Project time management is very important in the world of work and must be applied to everyone. But due to lack of awareness and application of time management, media that can be used to teach the importance of time management are needed. The use of game board as a learning media is expected to provide a better media to teach about the importance of time management to the community. Therefore, research on the use of the board games as a learning media about project time management is needed to know if board game can be used to teach about the importance of project time management.

METHODS

A mixed methods used in "The Use of the Board Games as Learning Media of Project Time Management" research, that is a combination of qualitative and quantitative methods. Qualitative method is the method where the research is done by explaining a phenomenon completely by collecting data as deeply as possible. Quantitative methods are methods for explaining a problem whose results can be generalized. (Kriyantono, 2010; 55-58) As for data processing analysis and design is done by linear strategy. A linear strategy is a gradual and logical sequencing strategy that easy to understand (Sarwono, 2007; 28). Stages of research can be seen in Diagram 1.

Diagram 1. *Stages of Research*
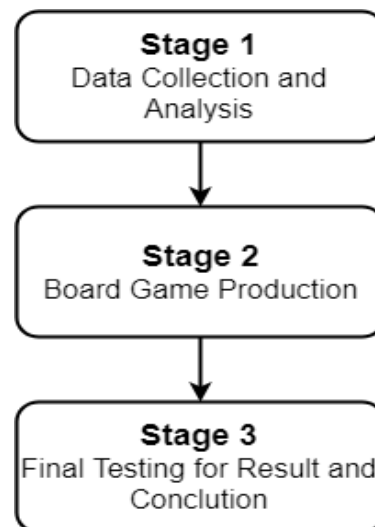
The qualitative data was collected by interviewing 30 college students in a town named Salatiga, and the qualitative data obtained from three companies working in the field of games and assisted from several sources of books, journal and internet based article. Data on time management problems is obtained from the interviews with college students and companies working in the field of gaming.

Data collected from various sources will be analyzed. The purpose is to be able to determine the most appropriate action and can be implemented when make the board game in accordance with the existing problems. Data analysis can also be helpful in the research to compare the collected data with the results data from this research in order to know the final results and conclusions of the study.

The design stage of the board game will be done in several steps. These steps start from the concept determination based on data analysis, testing the game concepts, designing the games in accordance with the themes and concepts that have been made, game development, and testing of game mechanisms to find problems in the game and resolve them. The board game will be made

by perfecting the prototype and improving the visual design that has been used before.

There are two types of project time management methods that can be used in managing project and will be implemented into the board game. Both techniques are time management with PERT (Program Evaluation Review Technique) and CPM (Critical Path Method). The PERT technique is a method by estimating project time using the estimated most optimistic, realistic and pessimistic time. CPM is a method that can help project managers to achieve project objectives such as estimating project completion time by finding critical paths by identifying the start until the end of each activity to find the project schedule and calculating the amount of time for each activity. (Caesaron, 2015: 62-63).

When the board game for learning media is ready, the next concept testing to ensure game suitability with the theme and concept will do. The testing is done by playing the board game that has been completed by testers from Komunitas Board Game Salatiga (Salatiga Board Game Community) and Satya Wacana Christian University Game Developer which most of their members are college students. When the game testing is over, the test participant will be asked some few questions in the form of a questionnaire about their understanding of time management and game board effectiveness that has been designed to teach people about good project time management.

The Likert scale is being used to gather data from game testers. The Likert scale is relates to statements about person attitudes toward something, such as agreeing-disagreeing, happy-displeasing, and good or not good (Umar, 2005; 132). The conclusions about success or failure of the use of board games as a media of good project time management can be made from these data.

RESULTS AND DISCUSSION

The data collected to obtain specific data about game board design to teach the importance of project time management. Data collection is done by a combination of quantitative and qualitative from two different sources. Quantitative data were obtained from 30 college students about the time management habits. This required stage to find out how deep understanding and awareness among students about the importance of project time management. The qualitative data were done by giving questions about time management project to three Indonesian game developers. Those three game developers are SIDJI Game Studio from Semarang, Educa Studio from Salatiga and Niji Games from Jakarta. This second phase of data collection is useful for obtaining information about time management at the work especially in the gaming industry.

The collected quantitative data show that 24 out of 30 or 80% of test subjects often have difficulty in completing tasks or jobs given on time. Out of 24 people, 11 subjects said they did not know how the proper way to manage their time. The rest says they know how to manage their time but still ignore it sometimes. Even so, more than 90% of students who often experience delays in completing tasks before the deadline still provide more than three hours to relax each day. Leisure time is usually used for playing games or using the internet such as social media. From the data obtained in this first stage, it can be concluded that the understanding and awareness of the importance of time management is still lacking.

The collected qualitative data show that the key problem of delay in completing a project have been experienced by all three game developers. From the data obtained from those three game developers, they have some ways to overcome the problem about

delay in completing the project or work before the deadline. These ways are (1) Provide direction and plan well the job before starting the project. (2) Make a to-do-list and determine which work to do first. (3) Make a realistic deadline (4) Ensure that all employees can communicate with each other in order to adjust one job to another. (5) Ensure that all employees prioritize important job prior to other work. The data obtained from this second stage can be used in the research to determine the ways of project time management that can be implemented in board game.

The data collected later analyzed to be used into game board design according to the research. The results of data analysis are then used as a consideration to determine the theme, game type, limitations and time management knowledge to implement into the board game that will be created. The implementation of time management into the board game is very important and should be clearly visible in the game, so that the game can achieve the expected purpose.

Understanding the importance of time management will be received, if the board game clearly indicates the advantages and importance of project time management contained in the game. In order to bring up the proper project time management on the board game, some elements of time management such as planning, preparing to do list, prioritizing important work and adjusting the work with others also need to be implemented into the board game.

The game-design process to teach the importance of project time management is divided into five stages. These five stages are (1) concept phase, (2) test play for game concept and mechanic, (3) visual design phase, (4) test play for user experience phase, and (5) production phase. Game design process can be seen in Diagram 2.

Diagram 2. Game Design Process
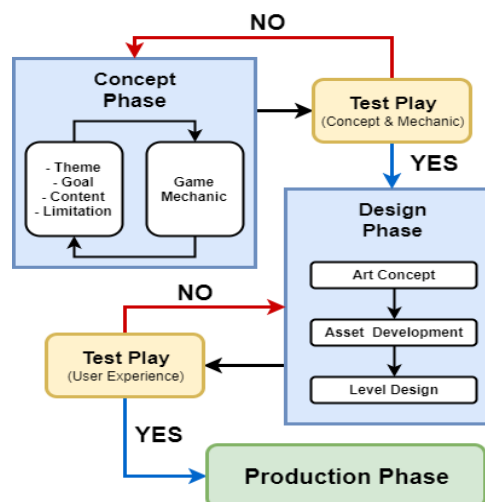
The concept phase is the stage where the designer constructs some ideas such as themes, objectives, content and limitation that will be formed into a game mechanism. At the concept phase, the designer can determine how the board game is designed how it to play. This phase is the first phase in board game development. At the concept phase stage, the previously collected data are analyzed and then simplified into points that can be implemented into the board game. The project time management points to be implemented in the game are: (1) Make a to-do-list and arrange them. (2) Plan before starting to project. (3) Good communication with a co-worker. (4) Prioritize important work. These four points are considered the most important points that must be implemented in the board game.

The theme used in board games for this research regards a small game developer who is creating a game in a specific time limit. During the process of making a game, each member of the company will try to increase their company and their own fame. When the game reaches the end, the member with the highest fame value will be the leader of the company.

The goal of the game is to make every player to work together and finish making a game before the specified time limit. In

addition, players must be able to organize their own works with other players' works as efficiently as possible. The players must also collect points or fame by doing other unimportant works to become the best player. Even so the players must be able to prioritize their main job if they want to win the game. Any works completed by the players will generate points. That point will then be added to find out how far the game they made has been completed. When all players still has not completed the required game upon reaching the deadline, they are considered defeated. However, if the game has been completed before the deadline, then all players are considered successful and the player with highest point will become the best player. At this stage, the board game is titled Days to Deadline: Game Dev Edition.

The mechanism used in this game is the worker placement. Worker placement is one of the game mechanisms in a table top game where players can adjust the player's actions by placing a mark on the board or card. In this game the marker is six dices, in which each player must put their dices on the board or available cards. Each dice used by the player represents the in-game working hours. Therefore, every player should be able to distribute their dices as effective as possible.

The challenge in this game is every player must be able to adjust their own works with the other players. This is because some works can only be completed by players if they met the requirement. The requirement that must be fulfilled in every works is in the form of completion of other player works or other work of that player. Therefore, the player must be able to determine which job to do first.

In the concept phase, all time-management elements that want to be implemented are converted into game components. In this case, players are divided into three job roles which are a game designer, a game artist, and a game programmer. Those three job roles will have each own job where each job must be related to their own roles. In

addition, there are other side works that will be used as a diversion in the game.

Play test for concept and mechanic will be started when concept phase is finished. This play test is to see if the concept of the game was made in accordance with the desired theme and goals. Temporary prototype is needed to do the play test and so the game can be tried first. If the game still cannot met with desired game play, then the concept phase will be re-done again until it finds a game play with a mechanic or appropriate mechanism. If at this stage has been found the appropriate game play, then the design phase can be started

After going through the play test and obtained the appropriate game play with the desired theme and game concept, components required in the game Days to Deadline: Game Dev Edition will be known. The required gaming components in the game to teach the importance of time management are: 45 main job cards with 15 cards each job role, 30 side job cards, 12 mission cards, three sets of dice for players with six dice each set, six dice freelancers, one play board, one genre board, three player boards, three fame tokens, two time tokens, 40 progress tokens, three quality tokens and three stress tokens.

Design phase will be started after going through concept phase and test play. The Design phase aims to get the best visual design in the game. In the design phase, all components and prototypes are designed to look more attractive. All elements in the game have to be designed so it matches with the theme of the game. The layout of each element and component needs to be taken care to make the game feel more interesting. To make a good board game, each component design also needs to be designed to be convenience so it will not reduce the fun while playing.

After doing the game design, another play test is needed to check the comfort and user experience while playing. The point needed to check from this test is the experience during playing for example is the game pictures and color is comfortable

enough for player. In addition, the layout of the elements in the game is also has to be considered for the playing experience. In this play test, it is also possible to improve some missing things during the concept phase. Design phase needs to be performed again if in this second play test there are some design errors such as miss typing, layout error or if the board game still feels uncomfortable when played because of its visual appearance. This stage will end when the board game is already met appropriate visual design and playing experience.

If the design phase has been completed, then the board game can be produced for final testing. When the board game is already using the best design that has been selected previously in the early test play, this stage will do. The end result of this stage is a board game ready to play and use for final testing. The end result of Days to Deadline can be seen in Image 1.

Image 1. Days to Deadline : Game Dev Edition
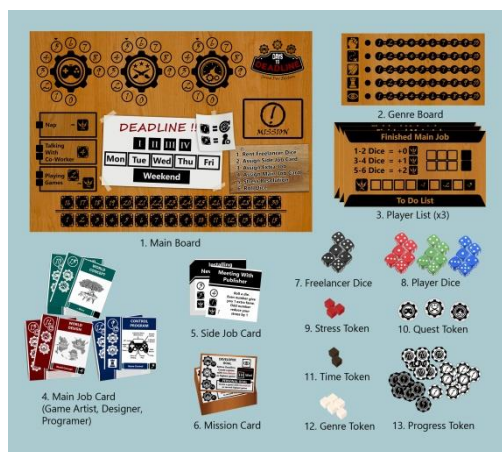
The final tests were conducted to Salatiga Board Game Community and Satya Wacana University Game Developer. The purpose of this test is to get the data whether the Days to Deadline is in accordance with the theme and concept. In addition to knowing whether the board game created can already be used to teach the correct project time management. The tests were conducted onto 15 people. Those participants are Nine people from Salatiga Board Game Community and six people from Satya Wacana University Game Developer.

The final testing is conducted by giving questionnaire to test participants of Days to Deadline: Game Dev Edition. The content of questionnaire is divided into two types of questions. The first type of question is testing about the participants understanding of project time management. The second type of question is a question that can be answered after the participants playing Days to Deadline: Game Dev Edition. From this test, there are two data that can be acquired for this research. The first data is about participants' understanding and attitude towards good time management. The second data is data about the use of Days to Deadline: Game Dev Edition as learning media of project time management.

The questionnaire used for collection data during the testing of Days to Deadline: Game Dev Edition uses 2 types of questions. The first types of questions are multiple choices in which test participants choose between agreeing or disagreeing with the statements that have been provided while, the second question in the form of essay in which participants are asked to write a feedback and suggestion and the reasons of test participant answer. Test participant answer will be used as reference to improve the quality of Days to Deadline: Game Dev Edition as a learning media for good project time management.

There are three answers in the multiple choices question in the questionnaire. Those three answers are: (1) "yes" answer means the test participants agrees or has the same opinion as the given question or statement. (2) "No" answer means test participants disagree or have other opinions with given questions or statements. (3) "Neutral" means test participants do not answer or the answer is not too clear between agree or disagree. The results of the data collection have been summarized and can be seen in Table 1 and Table 2.

Table 1. Understanding of Project Time Management

Test Participant is	Yes	Neutral	No
Understand what is project time management	15	0	0
Agree that project time management is very important	14	1	0
Understand how to use project time management properly	6	0	9
Already used project time management properly	2	1	12

Table 2. Days to Deadline as Learning Media

Days to Deadline	Yes	Neutral	No
According to project time management as theme	14	1	0
Teach people about proper project time management	13	2	0
Effective as learning media of project time management	13	1	1

Table 1 show all participants understood the meaning of project time management was and 14 participants (93.3%) considered time management is very important. Out of the 15 participants, only six (40%) who know how to use project time management properly. Out of those six participants, only 2 (13.3%) participants using time management properly. Although almost all test participants consider project time management is important. Nevertheless the data obtained indicated that the understanding and awareness of the importance of time management is still lacking among participants.

Table 2 shows data about something participants think about *Days to Deadline: Game Dev Edition* as learning media of project time management. In the first point, 14 participants think that *Days to Deadline: Game Dev Edition* is in accordance with the theme of time management. The rest is considered to give neutral answers because they said "*Days to Deadline: Game Dev Edition* is in line with the theme, but some details can still be added or adjusted for more project time management as theme."

For the second point in table 2, the 13 participants said that *Days to Deadline: Game Dev Edition* has already taught people about project time management properly. Some test participants said that players had to prioritize important work and adjust their work to the work of other players are the most prominent factor in teaching proper time management. However, out of 15 test participants, two participants answered neutrally. One of the test participants said "Only a few people can accept time management lessons from the game board of *Days to Deadline: Game Dev Edition*" and one other participant said that "*Days to Deadline: Game Dev Edition* is still a bit complicated for some people so they will probably have difficulty to notice the value of time management in the game".

For the third point in table 2, the 13 from 15 test participants assumed that *Days to Deadline: Game Dev Edition* were effective enough to be used as learning media about proper project time management. Some test participants said that using the board game *Days to Deadline: Game Dev Edition* to learn time management is not only more fun, but can also sense the importance of project time management. In addition, board game can also be played during pastime. Only one out of 15 participants said that "Using board games as learning media still accord on who plays it. If the person is not familiar with the theme, then the effectiveness of board games is not too high". One participant also said "*Days to Deadline: Game Dev Edition* became less effective, because the time spent to play was still too long."

From the data collected in this final test, we get suggestions and feedbacks for *Days

to Deadline: Game Dev Edition. With this feedbacks and suggestion, Days to Deadline: Game Dev Edition can be improved and refined into better learning media of project time management. In addition, by changing the theme and content of this game, Days to Deadline: Game Dev Edition can be used as a basis to manufacture other board games with different themes but with the same purpose.

CONCLUSION

The project time management is clearly very important in project or daily basis. However due to the lack of awareness about time management itself, so many jobs are not completed in time or else can be completed by reducing rest time. Therefore there is an effective and more interesting way to teach people, especially the students to manage time, especially project time management properly. To solve this problem, Days to Deadline: Game Dev Edition was created as learning media that can be used to teach the importance of project time management. The results of this research can be concluded, if the theme and time of play can be adjusted to the people who play it, thus, the use of Days to Deadline: Game Dev Edition as a learning media of project time management is very effective. This is because the person who plays it can feel the importance of project time management and at the same time can be act as pastime.

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