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Flutter Framework Mobile Application Development of Gamified Automotive Reseller Team Management

[1]Edmund Johnson, [2]Gunawan Wang
[1,2]Information Systems Management, BINUS Graduate Program – Master of Information System Management, Bina Nusantara University, Jakarta, Indonesia
Email: edmund.johnson@binus.ac.id[1], gwang@binus.edu[2]

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Gamification, Reseller, Automotive, Flutter, Development

Abstract. Expanding company digitalization procedure can be considered a task any company should take into consideration. This also applies to sales and marketing division in a company. Gamification is considered one of various ways to apply digitalization, mainly in sales teams. A gamified model of automotive reseller team management was developed as a solution in order to answer the issue stated above. To aid in applying gamification mechanics into application development, System Development Life Cycle (SDLC) waterfall method was used in this research. In making the gamified system into reality in the form of mobile application, Flutter development was used, considering its versatile cross-platform mobile application environment and ease of development.

1. INTRODUCTION

Nowadays, expanding any corporation operational procedure into digitalization is one of the most common business practices we can find today. Whether the said corporation is a newly established company that has not age for long, or a large enterprise that has already run for generations with ever-expanding networks. This also applies, mainly to sales and marketing in a company. Among all other operational divisions we can find in a company, sales and marketing division is one of the most critical one, where revenue of a company comes from its sales [1]. It is crucial to note that sales and marketing division is a part inseparable from everyday operational survivability of a company.

In order to keep operations of a company running, a reasonable amount of financial balances must sustain. And to keep this company balances sustain, one of the most common source of income can be found is from conducting sales. In a company, sales and marketing can be conducted by the company itself, or by creating diverse divisions of marketing networks as a helping hand of said company sales division [2].

Maintaining the ever-growing network of sales teams is no simple task. Digitalization presents the purpose of providing ease in maintaining the network in a large scale, which bringing transformation in such network [3]. It is also important to keep motivation and engagement of sales teams from declining. It is common that the tasks of sales teams are not only to contribute to the company in generating sales, but also making difference and contributing in society [4]. Among various types of solutions available, gamification can be used in this case.

This study takes place in a motorcycle showroom located in Medan city. This showroom acts as main authorized dealer of one particular Indonesian motorcycle brand. It sells three-wheeled motorcycles, All-Terrain Vehicles (ATVs), trail motorcycles, and electric vehicles. It also provides repair service and spare part sales.

This study explores the development of gamification solution in order to maintain sales teams, in this case, automotive reseller team management. We use System Development Life Cycle (SDLC) in order to conduct analysis and design of this resulted gamified system. The gamification itself was modeled using Mechanics, Dynamics, and Aesthetics (MDA) framework. The development of the gamified system was done by using Flutter framework.

SDLC takes role of conducting analysis and design of the gamified system. This methodology provides modelling of the flow of the gamified automotive reseller team management. It also ensures that all of the requirements of users are fulfilled [5]. In order to model the gamification, mechanics

was used in determining game mechanics of this system. Dynamics takes role of determining rules to be played, and Aesthetics define the goal of the player [6].

This resulted in a gamified automotive reseller team management in the form of mobile application. Following the ever-developing mobile application programming frameworks, choices available are Xamarin [7], Ionic [8], React Native, and Flutter [9]. The latter was chosen in this research, mainly due to the ease of development it provides [10]. Flutter was developed by Google in 2018 [11] as the main cross-platform development environment for mobile applications. In other words, Flutter framework allows applications from multiple operating systems can be run from one single codebase [12].

2. METHOD

The methodology adopted in gamified system design is System Development Life Cycle (SDLC). SDLC is also known as the Waterfall method. This method provides step-by-step sequences in order to carry out a system development. SDLC can be considered a systematic and sequential approach, which provides analysis, design, coding, testing, and maintenance step [13]. In other words, the purpose of SDLC is to deliver high-quality work that meets and exceeds client expectations while remaining on budget and on schedule.

In order to propose the gamification model itself, we utilize Mechanics, Dynamics, and Aesthetics (MDA) framework. MDA was first proposed by Hunicke et al. [14] as one of the most common frameworks used in gamification design. The mechanics was defined initially, followed by determining the dynamics and aesthetics of each mechanic. Mechanics of gamification design represents the game components used in the game design of the gamified system. Dynamics represents the rules determined in order to make the game mechanics work as intended. Aesthetics represents the goals to be reached by players. The process flow of gamification design using MDA is shown on the figure below.

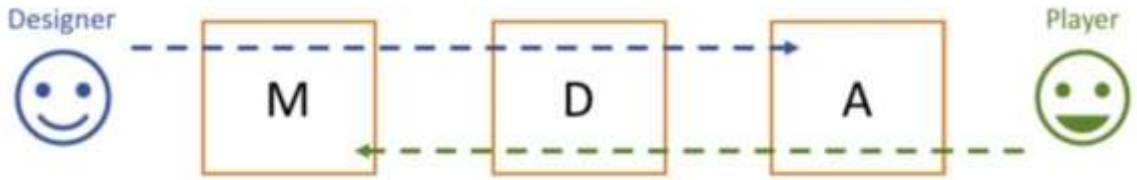

Figure 1. MDA Framework [6]

We initially conduct the game design of the gamified system in order to aid in designing the game mechanics. The mechanics defined are used in system analysis and design by utilizing the SDLC waterfall method. The steps of SDLC waterfall method are shown below.

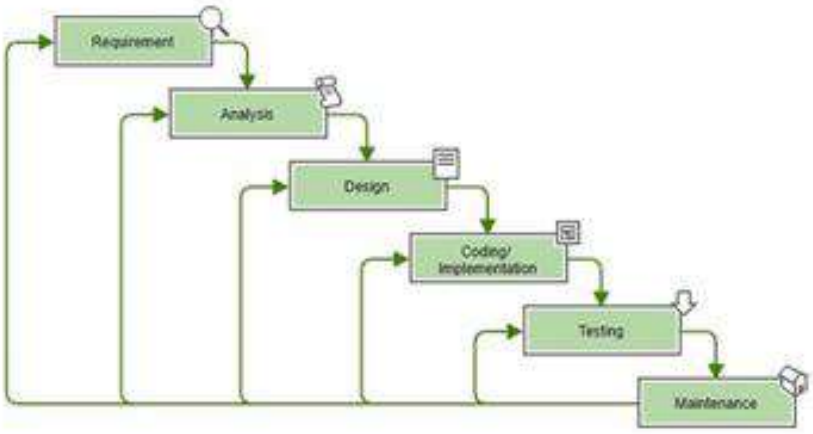

Figure 2. Steps of SDLC Waterfall Method [15]

This research mainly adopts qualitative approach. In order to implement the gamified system into reality, we used Flutter framework to code the gamified system. Due to its versatility and cross platform ability which supports multiple platforms when released, Flutter framework was chosen. This mobile application programming framework is considered as one of the fastest developing frameworks, due to continuous support from its large community, judged by releases of hundreds of packages and plugins The coding structure of Flutter is mainly consists of widgets [16]. Flutter also allows hot reload, which provides ease for developers to create instant results, implicates to faster and interactive application programming environment [17]. The framework uses Dart code language to code Flutter. It provides syntax based on C language and object oriented [18].

In order to accommodate this research, the Flutter SDK version used in this research is 3.3.2, and the Dart SDK version is 2.18.1. The coding process was done in Visual Studio Code. This study conducted in an automotive showroom located in Medan. The respondents of this research are reseller teams under supervision of the showroom.

3. RESULTS AND DISCUSSION

Gamification Design Result

Based on the gamification system design carried out, we proposed six mechanics, each represents different rules. These mechanics are mentioned as following below.

Table 1. Gamification Mechanics and Rules

No.	Mechanics	Rules
1	Point	Players are able to earn points by completing challenges, which adding the team points. Said earned points grant rewards.
2	Progress Bar	Represents visualization of points in a colored bar. Unfinished tasks turn the progress bar orange, and finished tasks turn the progress bar green.
3	Challenge	Represents missions needed to be completed by players, which grant players points as the reward.
4	Achievement	Represents achievements earned for the player lifetime, can be seen from medals from player profile.
5	Badge	Represents player tier, earned from accumulating points from completing missions or challenges.
6	Leaderboard	Contains list of every member of particular reseller team. Each comes with earned points.

Software Development

From the gamified system mechanics above, software development of the system was then carried out. On this stage, implementation process of the gamification mechanics created on the previous stage was carried out. Dart code language was used in the coding process in order to produce a gamified system of automotive reseller management with Flutter framework. Each page of the application developed in this stage can be seen below.

Home Screen

When player navigates to the Home Screen, the screen shows the point of logged player and team. It also shows the player position in leaderboards. Player can also check unfinished missions from this screen.

Figure 3. Home Screen

Product Screen

When player navigates to the Product Screen, a list of products is shown. Player can check the number of sales done by logged player on this screen. A brief information regarding particular product item can also be seen from this screen.

Figure 4. Product Screen

Order Screen

When player navigates to the Order Screen, a list of created order closings by logged player is shown. The player can check the transaction number and date of particular order item on this screen.

Figure 5. Order Screen

Mission Screen

When player navigates to the Mission Screen, a list of missions for logged player is shown. From this screen, player can check whether particular mission is finished or not.

Figure 6. Mission Screen

4. CONCLUSION

Based on the needs and requirements of automotive reseller management, we were able to propose the development of gamified solution for the system in the form of mobile application using Flutter framework. With the aid of SDLC waterfall method, a step-by-step process can be conducted in order to produce a gamified system which supports cross platform, opening a wide network of reseller teams to take advantage of this gamified system.

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