Designing Game-Based Service Desk towards User Engagement Improvement

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Abstract

Along the implementation of Information Technology (IT), there are incident, request, problem, and event. According to this, organizations need to implement a function which can be a single point to provide communication between IT service provider and IT users. Information Technology Infrastructure Library (ITIL) mentions service desk as a function to operate solution of this matter. But, recently organizations find new challenge which is related to service desk staffs' motivation. The repeated activities which are run by service desk may cause saturation. This situation will affect workplace enviroment and productivity. In this research, we propose a design to help organization build game-like activities as solution to boost service desk's motivation which can give good impact to service desk's quality. Our proposed design uses game approach and ITIL practices to ensure that game-based service desk is well designed.

Keywords: gamification, service desk, ITIL

1. Introduction

In the traditional time, information technology (IT) was percieved as a tool which was not directly related to business and strategy level. But, nowadays there are alot of organizations which use IT as tools to support top level in making decision which means IT is now transformed as asset which is directly related to strategc level [1]. Therefore, organizations invest large amount of money for IT because they aware about what position of IT within their organizations. Unfortunately, expensive cost which is invested can not help organizations in avoiding incident of IT [2].

When IT based activities are interrupted, there will be delayed activities which will positively deliver unexpected impact to organization [3, 4]. According to this matter, IT services providers must ensure that all events which are related to IT services and operations are well managed. IT users must be provided clear mechanism about what should they do, and where should they report the interuptions. In order to help IT users to make a report about IT services, organizations or IT service providers must implement service desk which acts as single and first point of contact.

To implement service desk, organizations need to run best practices which provide suggested ways in managing IT services. Organizations should run IT governance practices which enable control and alignment between IT functions and business goals [5]. In this research, we use Information Technology Infrastructure Library (ITIL) as one of well known and recommended IT governance practice which is used by organizations around the world to manage IT services [6, 7].

Unfortunately, ITIL just provides suggested activities and mechanism to deliver excellent IT services. It does not provide a way to engage service desk staffs. Whereas, according to previous research, there is correlation between user engagement and successful IT implementation [8]. It is also supported by other research which mentions that the effective ITIL implementation has positive correlation to user engagement [9]. According to this matter, we believe that organizations which implement service desk need other approach to ensure that service desk employees are engaged. Hence, we propose the integration of ITIL practices and persuasive approach which is named gamification.

2. Research Method

This part will describe about methods which are used in our research. In this research, we use conceptual framework for designing gamified-service. This conceptual framework provides systematic steps to build gamified-service by using gamification model and ITIL [10]. Moreover we use Marczweski model and user engagement scale as evaluation approach.

2.1. Integrating Gamification and ITIL

Gamification is defined as the use of game element design in non-game context [11]. It provides persuasive approach to boost users' motivation and help users to reach system owner's goals. Gamification is first bounced to surface when scientists who research about human's brain around the world agree that challenge-achievement-reward loop promotes production of dopamine which can create the sense of satisfaction and desire to play again [12].

In general, the implementation of gamification aims to motivate users. It can be used to motivate users of system, such as staffs, costumers, students, etc. In organization, manager is person who responsibles to motivate the staffs. A manager has to give attention to staff's personal issue because it can give negative impact to productivity [13]. But, most of manager IT, includes service desk manager can not handle this issue because the lack of psychology knowledge [13].

In 2025 staffs will be transformed to millenial staffs [13]. They will be more active, optimist, success-driven, independent, and technology consumer [13]. Therefore, organization should find new approach to help manager in motivating staffs. Gamification can be a solution because the characteristics of millenial are fit to the gamification concept. Gamification drives the challenge, use technology, and the tasks are clearly defined. Moreover, the use of gamification can help manager to create fresh and fun environment, give reward to high performance staffs, and build collaboration.

In 2014 there is a research which has proved that there is an opportunity to run gamification along ITIL implementation [14]. But, this previous research was not providing clear picture of integration between ITIL and gamification. While other researches also proposed the design of gamified service desk [15]. But it does not describe about how to select game elements. In fact, when gamified-system developer skips this step, it will drive the failure because organizations directly force users to use the game element which are selected organizations as system owner. When it happens, users will use elements which are not suitable with their motivation [16]. According to previous research, we conclude that the integration of gamification and service desk is possible to do. Moreover, we entry some improvement like motivation theory to choose game element and user engagement scale as evaluation instrument.

2.2. Marczweski Model

Marczweski model offers the gamification model which is related to users' motivation. Users' motivation is used to choose game elements that will be embedded in the system. According to motivation theory, there are 2 types of motivations [17]. First, extrinsic motivation which is related to actions which are triggered by reward. Second, motivation intrinsic, it comes from the willingness. People with instrinsic motivation do their tasks because they aware their role. There are a lot of opinions say that intrinsic motivation were better than extrinsic [12]. But, organization needs to respect both motivations and it must help the staffs to get what they want. This situation will build satisfaction and trust of staffs which drive them to give more.
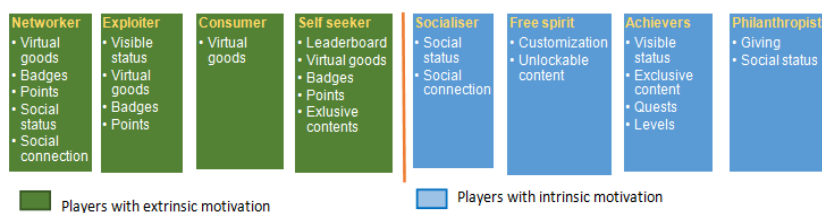

Figure 1. Marczweski gamification contents

Marczweski identify the type of player by the type of motivation. This idea is modified from Richard Bartle's player's type [18]. Figure 1 shows the gamification contents for every type of player which is adapted from Marczweski model.

2.3. User Engagement Scale

User engagement is defined as cognitive and emotional aspect. It represents the feeling of enjoy and absorbed when doing a task [19]. We believe that when staffs are engaged their satisfaction will be increased. Meanwhile, when staffs as users are motivated and satisfied, they will be boosted to be more productive [13].

In this research, we use user engagement scale (UES). It is introduced by Heather 'O Brien in order to identify the degree of user engagement [20]. We implement UES to current system and game-based service desk in order to prove that by adding game elements, user engagement will be increased. The attribute of UES are focused attention (FA), aesthetic (AE), novelty (NV), perceived usability (PU), endurability (ED), felt involvement (FI) [20].

2.4. Service Desk Quality

In order to prove that there is correlation between user engagement and service desk quality, we need to evaluate the quality of non game-based service desk and game-based service desk. The basic indicators of good service desk are response time, call rate, records of request call, rate of complaints, accuracy of incident classification, growth rate of desk incident, rate of incident handling, and first call completion rate [6].

3. Result and Analysis

In this research, our case study is one of enterprise in Indonesia. It is going to be mentioned as XYZ Cooperation. XYZ Cooperation is one of enterprise which is owned by government. It acts as public service provider such as mail delivery, package delivery, bill payment, etc. XYZ Cooperation uses IT to support daily activites. It also has IT division that ensures IT availability to support business goal.

As an initial activity, we do observation and interview the manager of service desk in XYZ cooperation. The manager confirmed the result of interview that they need a new approach to motivate the service desk employees especially service desk analysts because there are incoming report about slow response for incident handling. According to this interview, we conclude that we are able to use XYZ cooperation service desk as a case study.

3.1. Current Situation

According to interview and observation, gamified-service is feasible. Moreover, it also can be tested in XYZ cooperation. XYZ cooperation has work unit which is named Operational and IT Helpdesk. This work unit consists 15 staffs, 1 manager, and 2 manager assistant. In previous part, we mentioned that service desk manager in XYZ cooperation said that there were incoming report about slow response in handling incident. Moreover, we found that there are some incidents whichare not recorded.Therefore, we need clear rules to ensure the conformance.

Operational and IT Helpdesk unit in XYZ cooperation runs a non game-based service desk. In this step, we need to identify the user engagement degree of non game-based service desk. Identifying the user engagement of non game-based service desk is important because we have to know where the position of XYZ cooperation service desk is. Further, the result of identification will be compared to the user engagement of game-based service desk. Table 1 shows the user engagement of non game-based service desk.

Table 1. The user engagement of non game-based service desk

Respondents	FA	PU	AE	ED	NV	FI	Total
1	53,33	57,50	48,00	52,00	40,00	40,00	48,47
2	53,33	55,00	56,00	60,00	33,33	33,33	48,50
3	51,11	55,00	48,00	56,00	33,33	40,00	47,24
4	55,56	57,50	56,00	60,00	33,33	40,00	50,40
5	51,11	62,50	48,00	60,00	40,00	53,33	52,50
6	55,56	57,50	52,00	56,00	40.00	40,00	50,17
Total	**53,33**	**57,50**	**51,33**	**57,33**	**36,67**	**41,11**	**49,50**

According to Table 1, there is an opportunity to boost the user engagement. The activities of service desk are fit to gamification concept. It has routine activities and engage people to finish the tasks. In this work unit, a manager responsibles to monitor the activities of IT service delivery. By using gamification, IT manager is not just provided a way to run performance appraisal and reward the service desk analyst, manager is also be able to do other task such as enabling collaboration among team members.

After gathering information and evaluating non game-based service desk, we need to identify what is our further target. In this implementation of gamification along ITIL, out target is getting positive improvement of user engagement and service desk quality.

3.2. Proposed Design

In this step, we prepare and design the content of service based on ITIL and the gamification contents. Service desk operates processes which are related to incident handling, problem handling, request fulfillment, event management, and access management. But, in this research we only choose one process. The chosen process is incident management. We choose this process because it is always being the first and priority process that is introduced in implementation of service desk.

The prototype of game-based service desk that we design is named as ELROND.It contains seven main features. Those are (1) record customer, (2) record incident, (3) solution database (4) known error database (KEDB), (5) escalation, (6) close incident, (7) leaderboard. Moreover, ELROND is used by three users whom ITIL mentions as main users. They are service desk analyst, service desk supervisor, and service desk manager. Figure 2 shows how every roles in service desk manage the incident.
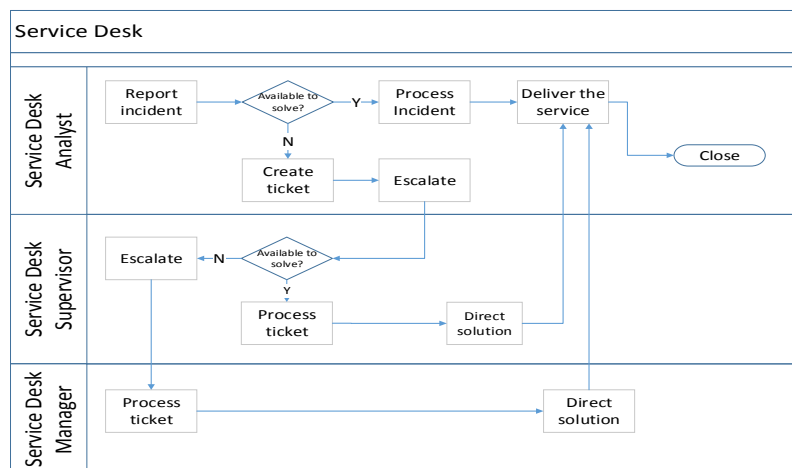

Figure 2. Incident management flow chart

First, IT users report the incident to service desk analyst. In this activity, service desk analyst creates a new data customer if customer does not exist in database.

Second, if the record of customer is already saved, service desk analyst inputs the details of incident such as incident category, description of incident, time and date of incident, level of urgency, etc.

Third, service desk analyst checks candidate solution from database. If suitable solution can not be found in solution database, he provides solution based on his expertise. This activity is also the mechanism of solution entry. All candidated solution must be approved by service desk supervisor. Once it is accepted and approved, it will be recorded as solution.

Fourth, incidents which are reported more than once will be recorded as a known error. The database of known error named KEDB. This feature will help organization to find the weakness of IT Service and it also enables opportunities to improve and evaluate the service. This feature contains incident records, solutions, and number of report.

Fifth, service desk analyst use solution database and his knowledge to deliver the solution if customer is satisfied and service is back to normal, service desk analyst can close the incident. In contrary, if solution is not working, service desk analyst must analyze the incident. In this situation, service desk analyst will get support and help from upper level. Escalation feature enables service desk analyst to create incident ticket and forward it to supervisor or manager. Manager and supervisor are responsible to open the escalated ticket. This feature enables collaboration among team member.

Sixth, when solution for incident is delivered to customer, service desk analyst closes the incident management process. ELROND starts the gamification process when the incident is closed.

Gamification has contents and clear rules. In order to choose gamification contents, we have chosen four types of players which represent both motivations. Those type of players are selfseeker, exploiter, socializer, and achiever. When the first time user interacts to ELROND, there is a pop up of questionaire. This questionaire is adapted from Marczweski gamification model which uses to identify the type of player and which game elements will be used to every service desk analyst.We use this approach to avoid the fault motivation and game elements identification which can lead to uncomfortable system environment. In this situation, service desk analyst will percieve that game elements do not serve them. But, beside the use of specific contents for every users, we use basic gamification content for all users such as leaderboard, point system, and user's profile.

The point system is divided into two type of points, experience points (XP) and redeemable points (RP). This point acts as virtual currency which can be converted to real incentives or specific contents. Figure 3 shows the flow chart of point convertion.
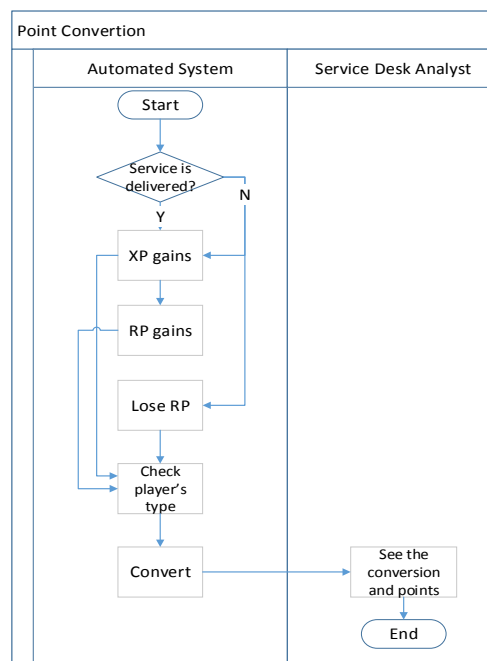

Figure 3. Convertion of points

After we figure out how system will operate, we will design the gamification rules. First, we need to design a rule for points. The system will automatically increase or decrease RP by checking urgency level and time of completion. In contratry, XP always gains because every action will increase the experience of service desk analysts. Table 2 shows the level urgency and time of completion.

Table 2. Level of urgency and time to solve incident

Urgency level	Estimated time to solve incident
1 = Low	12– 23 hours 59 minutes 59 seconds
2 = Middle	6 – 11 hours 59 minutes 59 seconds
3 = High	0 – 5 hours 59 minutes 59 seconds

As we can see on Figure 3, the system will check the status of service. When the time runs out, incident ticket is failed. This event will cause service desk analyst loses RP. In contrary, even the incident ticket is failed, XP keeps gaining because even incident ticket is failed, SDA gets experience. In other contrary, when SDA delivers the solution to customer on scheduled time as we can see in Table 4, RP and XP will gain. RP can be exchanged to desirable gamification contents and XP will pop the special content up when it reaches specific amounts. Table 3 shows the XP and RP rules.

Table 3. Rules for XP and RP

Condition	Urgency	XP gains when incident ticket is success	XP gains when incident ticket is failed	RP gains when incident ticket is success	RP gains when incident ticket is failed
XP current = 0-750	1	+10		+10	-5
	2	+12		+12	-6
	3	+20	+1	+20	-10
XP current = >751	1	+5		+5	-3
	2	+10		+10	-5
	3	+15		+15	-8

As we can see in Figure 3, after the incident report is closed, the gamification process is started, and ELROND runs point system. After the point system runs, system runs reward system. In reward system, XP and RP are converted to game element. The system will reward the game element based on the type of service desk analyst. There are six game elements which are related to point system. Those are virtual goods, badges, exclusive or unlockable contents, social status, level, and quest.

3.2.1. Virtual Goods Rules

This game element is given to self-seeker and exploiter. Virtual goods will pop up when user reaches spesified amount of XP. The virtual goods can be exchange to real goods such as, pizza voucher and theme park voucher. Table 4 shows the rules of virtual contents. This game element depends on XP

Table 4. Rules of virtual contents

Virtual Goods	Description	Required XP
	Get voucher for pizza order	700
	Free couple of theme park tickets	3500

3.2.2. Badges Rules

Badges are related to reputation of service desk analyst. Table 5 shows the dependency of badges and RP.

Table 5. Rules for badges

Name of Badges	Description	Required RP
	Master III	1000
	Master II	3000
	Master I	7000

3.2.3. Exclusive/Unclockable Content Rules

In order to get exclusive content and unlockable content, service desk analyst with specified type must have big amount of XP. This contents are rare and given to the high performance service desk analyst with motivation intrinsic. Table 6 shows the rules of exclusive and unlockable contents.

Table 6. Rules for exclusive and unlockable contents

Exclusive content/unlockable content	Description	Required XP
	Free flight for 2 persons	10000
	Voucher for home appliance purchase	20000

3.2.3. Social Status

This element is given to socializer. It represents the social status of user in the system. Table 9 shows the rules for social status. Table 7 shows the rules for social status.

Table 7. Rules for social status

Name	Required XP
Beginner	300
Skilled	2000
Well-experienced	7000

3.2.4. Level

Level describes degree of experience. When the first time service desk analysts is registered, his level is first level. To increase the level, he should increase his performance and experience which are related with the amount of XP. Table 8 shows the rules for giving level.

Table 8. Rules for level

Level	Required XP
1	0
2 – 10	(Level x 5) + 50
11 – 20	(Level x 10) + 75

3.2.5. Quest

Quest is appeared when service desk analyst with specific player type reaches certain XP amount. Table 9 shows the rules for quest.

Table 9. Rules for quest

Name	Required XP
Quest 1	500
Quest 2	1500

ELROND has core elements such as points and leaderboard. Eventhough, service desk analysts have different type of player, their points can be seen by all system users. In this case study, socializers are treated differently; they can convert their RP to incentive if they need it. It is because they dont have elements which can be converted to real goods. If gamification is all about virtual elements, it can be failed. The gamified-system without real contents such as incentives, reward, gifts will be percieved pointless.

We build the fairest rules which mean all motivations are rewarded. It is needed to avoid further issue such as dissatisfaction, the feeling of unfair management, and distrust. As we can

see from Figure 2 that motivation intrinsic is still rewarded which means we have to build clear and fair rules.

3.3. Evaluation

In this part, we will evaluate our design and prove that there is a positive correlation between user engagement enhancements towards service desk quality

3.3.1. User Engagement Evaluation

By using UES, we evaluate the user engagement of ELROND. Moreover, we add case study to compare user engagement of ELROND and non gamified service desk staffs. This evaluation is held in August 13th-21st 2015. By comparing Table 1 and Table 10, we can see a gap between user engagement of non game-based service desk and ELROND which means by using gamification we can help XYZ cooperation to engage and motivate service desk analyst.

Table 10. User engagement of ELROND

Respondents	FA	PU	AE	ED	NV	FI	Total
1	71,11	82,5	88,00	72,00	80,00	66,66	76,71
2	86,66	70,00	88,00	80,00	80,00	86,66	81,89
3	82,22	85,00	80,00	84,00	73,33	80,00	80,76
4	77,77	80,00	84,00	72,00	73,33	73,33	76,74
5	84,44	82,50	88,00	84,00	80,00	80,00	83,15
6	73,33	80,00	92,00	84,00	86,66	86,66	83,77
7	79,26	80,00	86,67	79,33	78,89	78,89	**80,50**

3.3.2. Service Desk Evaluation

In this part, we will compare ELROND and non gamified service desk by adding same incident cases and measure the time of response. In this research, we use time of response in order to compare ELROND and non gamified service desk. Table 11 shows the comparison of ELROND and non gamified service desk time response.

Table 11. Time response comparison

Applications	Insiden	Level	Time response
Non Game-Based Service Desk	Incident A	Medium	12 minutes
	Incident B	Low	15 minutes
	Incident C	Medium	18 minutes
ELROND	Incident A	Medium	7 minutes
	Incident B	Low	10 minutes
	Incident C	Medium	10 minutes

This evaluation shows that ELROND is able to boost the productivity of service desk staffs. It happens because ELROND is embedded with clear rules which drive service desk staffs to response the incident ticket based on agreement. But, ELROND can not reduce the time of technical incident handling such as decreasing time of resetting server, etc. ELROND is just able to motivate staff in responding the incident quickly. When incident ticket is responded after agreed time, the incident ticket is failed and system will automatically decrease the RP. In contrary, service desk staffs will get job satisfaction and reward by following the agreed rules. It becomes prove that gamification is able to boost motivation, conformance, and productivity.

4. Conclusion

System users must be fully engaged to the system. It is also applied to employees of service desk because they responsible to communicate with users in order to help users fix incidents, problem, etc. When service desk analysts can not be engaged to the system, quality of service desk are affected such as giving slow response in handling incident. Userengagement has correlation with employees' motivation, involvement, and participation. According to this matter, we have designed of game-based service desk which uses to help

managers to motivate member of team, enable collaborations, giving reward for high performance member, and change organization. Moreover, we have proved that by adding game elements along service desk implementation, user engagement and service desk quality is positively increased. For further research, we can add more service desk quality indicators and finding what is the most influence user engagement attribute for designing game-based service desk.

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