Technology Acceptance Model and Motivation-Opportunity-Ability Theory Influences on Indonesian Dota2 Gamer Customer to Customer Online Know-How Exchange

Rah Utami Nugrahani¹, Nabsiah Abdul Wahid²

¹Telkom University, Bandung, Indonesia.
²Universiti Sains Malaysia, Pulau Pinang, Malaysia.

Abstract. This study conceptualizes the influences of technology acceptance model (TAM) and motivation-opportunity-ability (MOA) theory on customer to customer online gamer know-how. Although both TAM and MOA are well acknowledged and popularly applied in the literature, implementing both theories using the Indonesian online gamers scenario like Dota2 has not been carried out. This study reviews on the suitability of the theories to be extended into the virtual realm of Dota2. To achieve an understanding on this possibility is significant as the world is changing due to globalization and advancement of technology. This review has established the foundations of MOA theory in Multiplayer Online Battle Arena (MOBA) game environments. This indicates the possibility for the influences of perceived usefulness and perceived ease of use, motivation, opportunity and ability to be investigated on customer to customer online know how. The theoretical framework developed that explains the causal relationship among variables is based on the situational prime of Dota2. It is expected that future video game development based on this study’s framework can aid in the improvement of its players know-how.

Keywords: Technology Acceptance Model, Motivation-Opportunity-Ability Theory, Customer to Customer Online Know-How Exchange

1. Introduction
Access to online games and to play games anytime is easy as to players, online gaming is not just entertainment and leisure activities for them but it is also a social activity that keeps players connected to one another which will eventually shapes the community’s culture and know how. In the online gaming community, users can perform special roles, interact socially and exchange information. Since the online game consists of several segments as well as e-commerce such as online shops and virtual shopping arcades, it means the dynamic growth of online games and the possibilities of their utilization in trade create the opportunities of accelerated growth for the economy as a whole [1]. Internet network and online games penetration has become one of the driving factors for e-commerce growth in Indonesia. Indonesia provides a huge market for local and international e-commerce. In Indonesia today, the public’s culture, social behavior and life styles have shifted due to the availability and conveniences in using technological advances including online payment transaction methods. These changes indicate great potential to help improve the national economy if properly utilized. Gaming business through e-commerce for instance can offer excellent opportunities for economic growth in Indonesia [2]. In order to enhance the profit however, the online gaming industry in Indonesia needs to understand how to meet the basic needs of their users or players.
In general, online games have a lot of genres that create a large community of players which continues to grow as time passes by. With a lot of genres, and games they can play, players in particular need specific or special platforms and forums where they can express their opinions, ask questions or answer other players’ questions about certain games [3]. In Indonesia, the genre of online games that has penetrated Indonesia is linked to the Multiplayer Online Battle Arena (MOBA) appearance that was released in 2002 as a modified form of Warcraft and Aeon Strife; recently MOBA is observed to be in great demand by the players [4]. Dota2 (defense of the ancients) is the leader in the online gaming market and as it has become the best MOBA Games [5]. Dota2 by Valve is a popular online game with a player base of over 6 million unique users. There are two types of gamers; namely, casual player who plays the game casually and professional players who participate in Dota2 tournament with massive monetary payouts. Based on available data, this phenomenon encourages the online gaming industry in Indonesia. It is important then to see if gamers attention is linked to technology acceptance.

Liang and Yeh’s (2011) [7] study found that perceived ease of use (PEOU) of online games does not show a significant effect on user’s attitudes while playing games however it shows a direct effect to user’s intention to play online games. The survey also shows that if an online game is easier to play, it will directly increase user’s intention to continue playing as well as in enhancing the player’s intention to pay for virtual items and purchase additional characters or equipment that they perceive will boost their performance and enhance their gaming experience.

Research in the area of brand communities shows that customer value can be created from sharing of various resources, such as social, economic, and knowledge [9]. The “shared sharing” in knowledge exchange is the participants’ own education and experience [10]. The sharing exchange that creates value through informal “know-how trading” [11] and the exchange of know-how is the focus of this study. Know-how exchange occurs when customers connect with each other, and they exchange knowledge, contacts, processes, concerns, complaints, stories, or recommendations that will improve their well-being. Through the review, this study will identify variables that can help measure the influence of PEOU and PU as per theorized in TAM on the players (customers to customers) online know-how exchange. In addition, the review also identifies the measure for analyzing the influence of motivation, opportunity, and ability of players on customer to customer online know-how exchange.

2. Literature Review

2.1 Technology Acceptance Model (TAM) in Online Game

TAM is an effective framework for measuring user’s acceptance of technology [12]. The process of technology acceptance can occur in an online community as members share their knowledge with one another. Taking this into the gaming community then particularly for Dota2, this means that players or members in the gaming community can exchange any kind of information about anything that is related to the game at any point of time as long as they are communicating in the Dota2 community. As earlier stated, Dota is a MOBA game released in 2002 as a modified form of Warcraft and Aeon Strife [13]. Currently, MOBA games have dominated the online gaming market with the growth of Dota2 (defense of the ancients) that has become the best MOBA Games [6]. According to Steamspy (2017) [13], professional Dota2 matches are broadcast live over the internet and are sometimes over the television networks, with the number of viewers reaching millions of people [14].

2.2 Motivation, Opportunity and Ability (MOA)

Motivation-Opportunity-Ability (MOA) framework posits that the degree to which an individual processes information is based on the individual’s underlying motivation, on opportunities that exist and on abilities the individual possess. MOA is perceived to be quite comprehensive because it addresses internal driving forces and external conditions [15] that it has been applied in several marketing topics. Motivation according to Moorman (1990) [19] is defined as individual’s willingness to undertake necessary actions to accomplish a goal. It incorporates readiness, interest and desire to engage in information processing [20]. Opportunity refers to the availability of time and favorable conditions that enable information to be processed. Opportunity can be approached from a positive view of availability or from a negative perspective of impediments and limitations [23]. Ability is the extent to which
consumers have the necessary resources (e.g. knowledge, intelligence, money) to make an outcome happen [22]. Ability is synonymous of an individual’s skill, competence [21], and capacity to process information [25]. In the context of information processing, ‘ability’ is defined as skill in interpreting information in the message. In the context of online communities, ability to engage in customer to customer interactions is the competency in the process driving know-how exchange with other members.

2.3 Perceived Usefulness in Online Game
Perceived usefulness is the degree to which a user believes that using the internet is a useful tool [27]. This is further noted as the use of technology that improves a consumer’s performance [28]. Usefulness is also defined as the belief levels of e-consumers that enhance the actual intention’s performance [28], in terms of buying products from e-retailing [29]. Perceived usefulness represents advantageous results derived from attributes of the technology being used through customer to customer online know-how exchange in the online community.

2.4 Perceived Ease of Use in Online Game
Perceived Ease of Use refers to the degree to which an individual expects no physical and mental difficulties in adopting the technology at hand [33]. Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort [28]. Perceived ease of use is further defined as the degree of belief among individuals on effortless usage of a system [35] namely, easy to use, easy to read, accessibility and quick to download [36]. Ease of use means that a visitor enjoys exploring the site for the first time [37].

2.5 Customer to Customer Online Know-How Exchange (C2C OKHE)
Customer to customer exchanges can take a variety of forms, and thus can result in various forms of value to the participants. The exchanges can be in terms of obvious economic value (e.g. sharing ideas that lead to reduced costs or increased revenues); and/or of social value [42]. Similarly, Mc Alexander et al. (2002) [43] noted that the essential resources shared among individuals in a community can be cognitive, emotional, or material in nature. In addition, they show how utilitarian exchanges often precede exchanges that are more social in nature, providing social, emotional, intellectual capital, and/or direct economic benefits [43]. The exchange of know-how, that was explained earlier as the focus of this study, is defined as the accumulated practical skill or expertise that allows one to do something smoothly or efficiently [44]. Know-how trading behavior is done through an informal network developed by professionals to get to know each other at conferences, online communities, or elsewhere.

3. Research Framework
The literature has acknowledged several studies that have analyzed the role of MOA in advertising information processing with interesting findings. Communication effectiveness for instance can be proactively managed by enhancing individual levels of MOA elements [21]; and it reflects the extent to which a situation is conducive to achieve a desired outcome [22]. Similarly, Mac Innis et al.’s (1991) [21] study highlights the mediating role of MOA in the relationship between executional cues and communication outcomes. Since MOA theory studies how individuals process several types of information in different contexts, it seems logical to assume of its capacity in analyzing the consumer’s decision to participate and engage in customer to customer know-how exchanges [26]. Moreover, many researches reaffirmed that the perceived usefulness is an important factor to refine the technology acceptance model (TAM) [46]. For perceived usefulness, items to measure it can fall into three main clusters. The first cluster relates to job effectiveness, the second to productivity and time savings, and the third to the importance of the system to one's job [28]. Figure 1.1 displays the research framework based on aspects taken from two theories, namely, TAM and MOA which are assumed to show influence over customer to customer online know-how exchange.
4. Methodology
Based on the suggested framework, a quantitative method study seems suitable to be conducted as the causal relationships between the independent variables, (perceived ease of use, perceived usefulness, motivation, opportunity and ability) and the dependent variable (customer to customer know-how exchange) is examined. For this type of quantitative study, a deductive approach is suggested; particularly as the aim is to test a theory consisting of variables, measured by numbers to determine whether the theory's predictive generalizations are correct [48].

From the review of literature, the measure of Perceived Ease of Use in this study can be adapted from those by Pinho and Soares (2011) and Lim & Ting (2014) who had carried out their research on a sample of university students. To measure respondent’s responses to this PEOU variable, a 5-point-Likert scale starting from 1=strongly agree to 5=strongly disagree; which is consistent with the scales used by several researchers [49] is suggested. The items are shown in Table 1.

| Table 1. Source of measurement scale item for independent variables – Perceived Ease of Use |
|-----------------------------------------------|
| **Original Items** | **Adapted Items** |
| PEU 1 | OGB sites do not require a lot of mental effort. | Interacting with Dota2 online community sites do not require a lot of my mental effort. |
| PEU 2 | OGB sites are easy to navigate. | Dota2 online community sites are easy to navigate. |
| PEU 3 | OGB sites are easy to learn. | Dota2 online community sites are easy to learn. |
| PEU 4 | I find social networks flexible to interact with. | I find Dota2 online community sites flexible to interact with. |
| PEU 5 | It is easy for me to become skillful at using social networks. | It is easy for me to become skillful at using Dota2 online community sites. |
| PEU 6 | Overall, I believe that social networks are easy to use. | Overall, I believe that Dota2 online community sites are easy to use. |

*Note: OGB (Online Group Buying)*

For the measure of Perceived Usefulness, this study suggests to adapt items from Davis (1989) [28] and Pinho and Soares (2011) [33] who investigated the perceived usefulness of social network among university students. To measure respondents’ responses to this variable, a 5-point-Likert scale starting from 1=strongly disagree to 5=strongly agree as per the ones used to measure PEOU is suggested. The items for measuring perceived usefulness are shown in Table 2.

| Table 2. Source of measurement scale item for independent variables – Perceived Usefulness |
|-----------------------------------------------|
| **Original Items** | **Adapted Items** |
| PUS1 | Using social networks enables me to socially interact with my friends quicker. | Using Dota2 online community enables me to socially interact with other members quicker. |
Using social networks improves my social life performance (I interact more often, and more updated).

Using Dota2 online community improves my social life performance (I interact more often, and more updated).

Using social networks gives me greater control over my social interactions.

Using Dota2 online community gives me greater control over my interactions with other members.

Using social networks improves the quality of my social relationships.

Using Dota2 online community improves the quality of my relationship with other members.

Using social networks enhances my effectiveness in maintaining my social relationships.

Using Dota2 online community enhances my effectiveness in maintaining my relationship with other members.

Using social networks makes it easier to maintain my social relationships.

Using Dota2 online community makes it easier to maintain my relationship with other members.

Overall, I find using social networks useful in my social life.

Overall, I find using Dota2 online community useful in my life.

*Note: OGB (Online Group Buying)

As for measuring MOA, those suggested by Gruen et al. (2006, 2007) seemed to be most appropriate. For the case of measuring ability for instance, the most common items suggested are the ones related to individual skill, competence, and perception of capacity. As such, the same items for the study’s use will be those adopted from Gruen et al. (2006, 2007) [50], namely, on individual skill, competence, and perception of capacity.

| Table 3 Source Of Measurement Scale Item For Independent Variables – Ability |
|-------------------------------------------------|
| Original Items | Adapted/Adopted Items |
|----------------|----------------------|
| ABI 1          | I generally find it easy to exchange ideas with other Internet forum participants. |
|                | I generally find it easy to exchange ideas with other Dota2 online community members. |
| ABI 2          | I can communicate clearly on Internet user forums. |
|                | I can communicate clearly on Dota2 online community. |
| ABI 3          | I am generally good at navigating within the forum. |
|                | I am generally good at navigating within the Dota2 online community. |
| ABI 4          | I consider myself very skilled in using the forum. |
|                | I consider myself very skilled in using the Dota2 online community. |
| ABI 5          | I am generally good at networking and have been successful at it in the past. |
|                | I am generally good at networking and have been successful at in the past. |
| ABI 6          | Generally I feel that the time I spent networking was productive for me. |
|                | Generally I feel that the time I spent networking in the Dota2 online community was productive for me. |
| ABI 7          | Often I did not share my knowledge because others might be my competitors. |
|                | Often I share my knowledge with Dota2 online community because others not my competitors. |
| ABI 8          | I have no issue in paying any bill related to the use of the online community forum. |
|                | I have no issue in paying any bill related to the use of Dota2 online community. |

The measure of opportunity was also from those that can be adapted from Gruen, Osmobelkov, and Czaplewski’s (2006, 2007) [51] study. To measure respondent’s responses to the items, a 5-point-Likert scale starting from 1=strongly agree to 5=strongly disagree is suggested for use. The items are shown in Table 4.
### Table 4. Source Of Measurement Scale Item For Independent Variables – Opportunity

| Original Items | Adapted Items |
|----------------|---------------|
| **OPP 1** | In general, I find that I just don’t have enough time to spend on the forum. |
| | In general, I find that I just don’t have enough time to spend on the Dota2 online community. |
| **OPP 2** | My organization has a policy that restricts my internet access for uses such as the forum. |
| | My organization gives the freedom to use internet access including being active in Dota2 online community. |
| **OPP 3** | My organization frowns upon participation in Internet-based forums. |
| | My organization supports my participation in Dota2 online community. |
| **OPP 4** | I am often frustrated by the downtime of the forum. |
| | I seldom frustrated by the downtime of the Dota2 online community. |
| **OPP 5** | If my internet connection was faster, I would use the forum more frequently. |
| | If my internet connection was faster, I would use the Dota2 online community more frequently. |
| **OPP 6** | The online community provided plenty of time for networking. |
| | The Dota2 online community provided plenty of time for networking. |
| **OPP 7** | The general atmosphere at the online community was conductive to building my professional network. |
| | The general atmosphere at the Dota2 online community was conductive to building my professional network. |
| **OPP 8** | If I did not have enough time to network, it was my fault, and not the fault of the scheduled activities. |
| | If I have enough time to network in Dota2 online community, because I take more time, and not because of the scheduled activities. |
| **OPP 9** | The breaks between the online community sessions were long enough for networking. |
| | The breaks between the Dota2 online community sessions were long enough for networking. |
| **OPP 10** | In order for me to have enough time to network, I had skipped one or more sessions at the online community forum. |
| | In order for me to have enough time to network, I had skipped one or more sessions at the Dota2 online community forum. |

Similar to the other variables, the measure of motivation in this study can be adapted from Gruen, Osmonbekov, and Czaplewski’s (2007) study as well as from Briliana et al. (2015) [24]. To measure respondent’s responses to the items, a 5-point-Likert scale starting from 1=strongly agree to 5=strongly disagree is suggested for use.

### Table 5. Source of measurement scale item for independent variables – Motivation

| Original Items | Adapted Items |
|----------------|---------------|
| **MOT 1** | The topics of discussion in the forum are generally relevant to me. |
| | The topics of discussion in Dota2 online community are generally relevant to me. |
| **MOT 2** | I am always interested in the issues being discussed on the forum. |
| | I am always interested in the issues being discussed on Dota2 online community. |
| **MOT 3** | Being on the forum energizes me. |
| | Being on the Dota2 online community energizes me. |
| **MOT 4** | When I attend the online community, I was ready to make contact that could build my professional network. |
| | When I attend the Dota2 online community, I was ready to make contact that could build my professional network. |
| **MOT 5** | Networking was major reason that I attend the online community |
| | Networking was major reason that I attend the Dota2 online community. |
| **MOT 6** | Throughout the online community, I was interested in meeting new people. |
| | Throughout the Dota2 online community, I was interested in meeting new people. |
| **MOT 7** | Prior to the online communities, I prearranged several contacts with another attendees. |
| | Prior to the Dota2 online community, I prearranged several contacts with other attendees. |
The measure the last variable in the framework, namely, Customer to Customer Online Know-How Exchange, the items can be adapted from those by Gruen, Osmonbekov, and Czaplewski (2006, 2007) [51]. Another source where the items can be taken is from Briliana et al. (2015) [24] which presents and tests a theoretical model that examines antecedents and outcomes of C2C know-how exchange in the context of face-to-face networking behaviors at professional association meetings. To measure respondent’s responses to the items, a 5-point-Likert scale starting from 1=strongly agree to 5=strongly disagree is suggested for use. The items are shown in Table 6

Table 6 Source of measurement scale item for dependent variables – Customer to customer Online Know-How Exchange

| Original Items | Adapted Items |
|----------------|---------------|
| **MOT 8** I had several “old friends” that I looked forward to seeing at the online community. | I had several “old friends” that I looked forward to seeing at the Dota2 online community. |
| **MOT 9** I am always ready to engage in discussion with/in online community amongst members. | I am always ready to engage in discussion with/in Dota2 online community amongst members. |

| **C2C 1** Overall, the forum is an important source of information for me. | Overall, the Dota2 online community is an important source of information for me. |
| **C2C 2** I find the interaction among forum users enhances my knowledge. | I find the interaction among Dota2 online community members enhances my knowledge. |
| **C2C 3** I can depend on the forum to provide answers to my questions. | I can depend on the Dota2 online community to provide answers to my questions about technical issues or gaming skill. |
| **C2C 4** In general, the ideas suggested on the forum are reliable. | In general, the ideas suggested on the Dota2 online community are reliable. |
| **C2C 5** I made many new valuable contacts at the conference. | I made many new valuable contacts on the Dota2 online community. |
| **C2C 6** I have little attachment to the other attendees at the conference. | I have little attachment to the other attendees at the Dota2 online community. |
| **C2C 7** I have valuable formal/informal partnership with some of the conference attendees. | I have valuable formal/informal partnership with some of the Dota2 online community attendees. |
| **C2C 8** I continue to exchange valuable information, ask/answer questions, etc., with other attendees that I meet at the conference. | I continue to exchange valuable information with other attendees that I meet at the Dota2 online community in order to trading hero/accessorises. |
| **C2C 9** I continue to exchange valuable information, ask/answer questions, etc., with other attendees that I met at the conference. | I continue to ask/answer questions etc., with other attendees that I met at the Dota2 online community to help me with purchase in order to trading hero/accessorises. |
| **C2C 10** More than the number of contacts I made at the conference, the most important value of networking was provided through one or two critical contacts. | The most important value of networking was provided through one or two critical contacts from the Dota2 online community. |
| **C2C 11** Overall, the value I received and expect to receive from networking was alone worth the costs of the online community. | Overall, the value I expected to receive from networking was alone worth the costs of the Dota2 online community. |
5. Conclusion

From the review of literature made, a framework integrating both TAM and MOA theories to measure Dota2 player’s (who are the customers in the study) customer to customer’s online know how exchange can be developed. Further review on the items to measure the variables show that these can also be suggested. To measure some adherence for more accurate results, in future, this research can be further tested using the items with samples of Dota2 players in Indonesia so that the applicability of the two theories in the framework can be verified empirically.

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