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USERS ENGAGEMENT SUCCESS FACTORS IN INFORMATION SYSTEMS DEVELOPMENT

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ABSTRACT

Business organisations need to implement information systems (IS) mainly for keeping track of and managing its business activities, from planning to product delivery. In the last four decades, the information systems recorded low rates of success. Many IS projects, especially in the public sector, fail as a result of poor user engagement in the information systems development process. Engaging user in any information systems development process is claimed to contribute to the success of IS projects. Some studies have indicated that two factors which are user participation and user involvement can lead to successful user engagement in the information systems development. However, there is still no common understanding for measuring and validating the effect of these two factors. This paper discusses the importance of these two factors as the critical success factors for engaging users in the information systems development. The importance of these two factors was determined through the content review technique and mapping activity of eleven sub-factors identified from the literature. A-priori model for user engagement success will be presented at the end of this paper.
Keywords: *Information Systems; User Participation; User Involvement; User Engagement*

1 INTRODUCTION

There are different categories of information systems such as management information system, executive information system, data processing system, and decision support system (1). In the past four decades, information systems (IS) have recorded low rates of success (31% in 2013) (2). This has resulted in big financial losses for the companies and organisations affected (3). In 2015, a review of 50,000 IT projects around the world was conducted by Standish Group. They concluded that the percentage of failure in 2015 was 19%, the percentage of success was 29%, and the percentage of the challenged projects was 52%. Based on this review, Standish Group (2015) identified 10 success factors for successful IT projects; two of the highest percentage factors were emotional maturity and user involvement with 15% for each one of them. In this study, emotional maturity and user involvement are referred to as user involvement and user participation.

There is a positive impact of user engagement on system success particularly in system use and user satisfaction. Users who participate in software development express high satisfaction with the system (4). Users are a very important source of information due to their knowledge of the nature of the work and its needs that have to be supported by the system (5). Therefore, engaging users in the development of information systems is essential for them to succeed (6).

User engagement is a term which includes both user participation and user involvement (7-10). User participation is the activities and actions that are performed by users during the development process of systems (11, 12). User involvement is a "psychological state of the individual, defined as the importance and personal relevance of a system to a user" (12). It also refers to "the degree of users' perception on their sense of ownership toward the system" (13). Lack of user involvement during the process of information systems development leads to system failure (14).

Both constructs of user engagement (user participation and user involvement) play a vital role in successful system development process. Discarding the behavioural aspects (user participation) or the psychological aspects (user involvement) generate an invalid information system. Researchers suggest that user involvement

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may be more important than user participation. This suggestion is based on the fact that degree of user satisfaction and successful system use is considered to be the beak of system success (7).

On the other hand, Abdallah and Zawiyah (9) claimed that user participation is one of the most important factors that is neglected and considered as unimportant during system development and designed stage. This leads to system failure and poor quality. The same study concluded that there is a considerable importance for participating users while upgrading and developing the information systems. In addition, user participation improves the attitude of users, considering that users can anticipate the significance of information systems in the future.

Bosman (15) imputed the importance of engaging users in the development process of information systems to these reasons: giving users comprehensive knowledge about how the system is built, giving users the right to develop their own expectation, decreasing the change resistance, and allowing members to be engaged in the work decisions. Further, Harris and Weistroffer (16) reported the benefits of user engagement as avoiding unimportant expensive features and quality improvement owing to accurate identification requirements. Similarly, when users feel that they are involved in the development process, they develop a positive attitude, which increases user satisfaction with the system (17, 18). When user engagement (user participation and user involvement) is utilised at Business Information Systems (BIS), the organisation will record a high volume of effectiveness (19).

In a recent systematic mapping study conducted by Abelein and Paech (8) concluded that user participation and user involvement and their related area contribute positively to system success. However, there is still no common understanding for measuring and validating this effect.

The motivation of this study is to illustrate and compensate the lack of understanding of user engagement in information systems development. Furthermore, this paper concentrates on identifying the critical success factors of user engagement success in information systems development. A-priori model for user engagement success will be presented at the end of this paper. In addition, it is intended to be the nucleus of success for extracting the benefits of user participation and involvement in any information system.

2 IDENTIFYING SUCCESS FACTORS

We have used three terms for our searching process: User Engagement, User Involvement, and User Participation. We have selected papers that are in the area of information systems and software engineering.

Due to the lack of theoretical and empirical evidence of factors that affect user engagement efficiently, a review of relevant literature is conducted to identify the factors that were directly or indirectly suggested as important. We start by identifying factors based on the classification that was conducted in the systematic mapping study by Abelein and Paech (8) and we extend the research by including latest related studies. In addition to the factors that were identified in another systematic mapping study that was conducted in the same area by Bano and Zowghi (20). In the literature review, we refine the factors that were studied in the information systems area and that were examined directly or indirectly with user engagement factors, as shown in Table (1):

In the following, we specify the factors that are implemented in our study; they were originally identified and listed in Abelein and Paech (8): User-Developer Communication, User Ability in IT Projects, User-Developer attitude, User Motivation, User Attitude toward System, Disagreement/Conflict, Complexity, Top Management Support, and Organisational or Managerial Culture. In addition, we have include factor that is suggested as important in Bano and Zowghi (20) and not mentioned in Abelein and Paech (8) which is called Identifying Members For Engagement. Furthermore, Involvement Congruence that is derived and discussed in detail in Doll and Torkzadeh (21) is also suggested by Bano and Zowghi (20) but in another format under the name of Degree and Level of User Engagement. These factors are explained in detail in the following sections.

Table 1 summarises the mapping of related studies that suggested and discussed implicitly and explicitly the user engagement success factors

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Table 1: User Engagement Factors

Candidate User Engagement Critical Success Factors											
Study	**User-Developer Communication**	**Identifying Members For Engagement**	**User Ability in IT Projects**	**User Motivation**	**User Attitude toward System**	**User-Developer attitude toward each other**	**Disagreement/ Conflict**	**Involvement Congruence**	**Complexity**	**Top Management Support**	**Organisational or Managerial culture**
(20)		X						X			
(16)		X				X		X	X	X	X
(22)	X	X			X			X		X	
(23)			X								
(8)	X	X	X	X	X	X	X		X	X	X
(24)	X									X	X
(25)								X			
(26)	X	X				X				X	
(27)			X								
(28)			X							X	X
(29)	X		X	X							
(4)	X	X	X	X	X	X	X				
(30)	X		X							X	X

A total of 11 candidate success factors have been identified: (1) User-Developer Communication, (2) Identifying Members for Engagement, (3) User Ability in IT Projects, (4) User Motivation, (5) User Attitude toward System, (6) User-Developer attitude, (7) Disagreement/Conflict, (8) Involvement Congruence, (9) Complexity, (10) Top Management Support, and (11) Organisational or Managerial Culture.

3 DERIVING THE A-PRIORI MODEL

These 11 factors are categorised under four group names: Development Process, Human Aspects, System Attributes, and Organisational Factors. These groups are categorised in Abelein and Paech (8), and this categorisation holds the same group meaning as in Cavaye (31) even if it does not hold the same group names. Development Process group consists of the activities of project entrants (e.g. users and developers) that take place and contribute to developing the system. Development Process group consists of User-

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Developer Communication, Identifying Members for Engagement, and User Ability in IT Projects. Human Aspects group is the beliefs or attitudes of project entrants. Human Aspects consists of User Motivation, User Attitude toward System, User-Developer attitude, Disagreement/Conflict, and Involvement Congruence. System Attributes group is the challenges and attributes of the system that will be developed. System Attributes consists of Complexity. Finally, Organisational Factors group is the effects derived from the organisational context of the IT project. Organisational Factors group consists of Top Management Support and Organisational or Managerial Culture. The following section discusses the factors in detail.

3.1 Development Process

According to Barki and Hartwick (12), User participation is the "behaviours and activities users perform in the system development process". Users participate in system development by performing activities and actions such as being the leader of the team, having the responsibility to select hardware and software, asking for funds, being responsible for paying costs, defining the format of the report, defining the screen layout, being updated by the developers about the stage of development, and evaluating the work done by the developers (4, 32).

3.1.1 User-developer communication

Weak communications between participants contribute to misunderstanding and conflict among members. Communication plays a primary role in exchanging information easily, initiating collaboration, and determining conflict and overcoming it. Effective communication plays a critical role when users participate in the process of software development. It is important for users to explain their needs and requirements to developers, and it is essential for developers to explain issues that are related to technical cases to users (33). Hartwick and Barki (34) identified user-developer communications as a factor that is used to measure user participation. Communication activity includes formal and informal exchanges of visions, opinions, needs, facts, and concerns regarding the project among the users and between users and other stakeholders of the project. User-analyst communication has been identified in the literature as a factor of system success. Communications between users and analysts provide the information that forms the basis of information system development (34).

User-developer communications play a moderating role in the relationship between user participation-satisfaction when the complexity of the task is high (35). Gallivan and Keil (36) conclude that if user participation failed to initiate honest communication between users and developers, the result may not meet users' need and it may not be accepted or rejected. User participation in developing software is crucial for system success, especially direct user-developer communications. User-developer communications have been studied as a moderating variable in the relationship between user participation and system success; however, it can be an independent variable that contributes to the success of user participation process. User-developer communications are neglected in most of large-scale IT projects; this increases the costs of implementation and increases the test effort (37). So, regarding the essential benefits of user-developer communications and the high risks in their absence, we hypothesise that these communications have a significant relationship with effective user engagement.

H1. There is a significant effect between User-Developer Communication and User Participation Success.

3.1.2 Identifying members for engagement

The development process varies depending on who is in charge. System development might be the responsibility of the developer, the responsibility of the end-user, or the responsibility of both of them and is done cooperatively (38). Determining the users that will engage in the process of development is an important factor. Before the process of selection, the user concept needs to be visible (20). Identifying the correct person out of a group of stakeholders, who have the right to participate, is an important role that achieves effective user engagement. Not all users have the same relevance to the software that needs to be developed. Not all users need to be involved during the process of software development. Therefore, sometimes a group of users will be chosen from all the involved users, and this group has the right to participate in the process of development (39). Bano and Zowghi (20) reported that identifying the right users to be involved as a necessary step which has impacts on user satisfaction. The professionals and managers should select users who can contribute positively and achieve high benefits when they participate. User engagement contributes positively to produce better data quality. Cooperation between developers, end-users, and managers also contributes positively to better data quality (38).

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Identifying users was highlighted as an important factor that contributes to effective user engagement with impacts on user satisfaction. The success of the whole process of developing information system is the responsibility of all members that are involved in the process. Due to the importance of carefully selecting members and the effects that they may leave, we decide to study impacts of member selection on effective user participation. We hypothesise that there is a relationship between identifying members and effective user participation.

H2. There is a significant effect between Identifying Members for Engagement and User Participation success.

3.1.3 User ability in it projects

User ability is the attributes and characteristics that qualify users to participate in the process of an information system development and be one of the members of the development team. Hunton and Beeler (40) study the relationship between user self-efficacy and desired participation. User self-efficacy is defined as the individual beliefs that enable users to perform certain behaviours effectively. Users who believe in their ability to succeed in certain behaviours desire to engage in different behaviours. In information systems, user self-efficacy refers to users' beliefs in their ability to successfully develop behaviours that are important to developing information systems. Hunton and Beeler (40) conclude that there is a positive relationship between user self-efficacy and desire participation in the information system development. In this study, we argue that user self-efficacy is an attribute of users' ability. So we decide to study user ability because it includes user self-efficacy and other attributes that are related to identifying users who are going to be part of the participation team.

Users who have a high level of ability will be more comfortable when they deal with information system developers. Moreover, they will be more confident to play their roles and share opinions during the development process in order to accomplish their task (41). High ability encourages users' interests and involvement to produce meaningful work (42). Meaningful work results from the confidence that users have to control and do their job and to be ready to participate in different activities of the development information system process (43, 44). Ability arises from different terms such as autonomy, responsibility, and satisfaction achieved through different task accomplishments (45). Chang, Sheu (46) built a model that studied the impact of users' ability in IT project and extrinsic motivation. They concluded that user commitment in the information system development process is influenced by extrinsic motivation and users' ability. Furthermore, commitment improves the collaboration during the system development process.

Users that have the ability to advance the project will become the most committed and indirectly will collaborate more effectively. From the aforementioned findings, we hypothesise that user's ability has a direct relationship with effective user participation. As a result, our study will explore this relationship. In addition, we argue that identifying the correct users should take care of the ability of users who will be selected, so we hypothesise that user's ability has a relationship with identifying members for engagement. And it can be an identifying factor for selecting the right users.

H3. There is a significant effect between User Ability in IT Projects and User Participation Success.

H4. There is a significant effect between User Ability in IT Projects and Identifying Members for Engagement.

3.2 Human Aspects

According to Barki and Hartwick (12), User involvement is the "psychological state of the individual, defined as the importance and personal relevance of a system to a user". It also refers to "the degree of users' perception on their sense of ownership toward the system" (13). Users feel involved in information systems if they recognize that there are a high value and a personal relationship to the system.

3.2.1 User motivation

User motivation is a psychological state that generates from the desire of the individual. It encourages users to dedicate considerable efforts to achieve the organisational goal in order to obtain the individual needs (46). As suggested by theory and empirical research, human motivation can be classified into two types: intrinsic and extrinsic. The intrinsic human motivation is defined as the individual's psychological affection toward all their work aspects (47). The extrinsic human motivation is defined as the individual's expectations to get the value and outcome from the future events (48). For information systems users, extrinsic motivation could be defined as the expectations from a useful system which may enhance their job, or the rewards that they may gain when they participate in the

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project (46). The level of efforts that will be invested by the individual in the development activities depends on the rewards that will be given (49). Users decide to be involved in the system development process and how much effort they will invest to maximise their benefits (50).

Extrinsic motivation plays an important role in users' commitment toward the target goal (51). Based on Expecting Theory, user commitment is affected by the outcome that is expected out of the relationship. If collaborating with the team has a high level of extrinsic motivation to earn positive benefits, the users will pay more effort toward the process of information system development and build a good relationship with the team. Extrinsic rewards are signals to the team members that they are of value and that they play an essential role in the success of the team (51). Chang, Sheu (46) built a model that studies the impact of users' ability and extrinsic motivation in IT projects. They concluded that user commitment during the information system development process is influenced by extrinsic motivation and users' ability. Furthermore, commitment improves the collaboration during the system development process. It is important that managers of information system development projects have high flexibility to reward both users and information systems staff depending on their performance with the team. Therefore, because user commitment is an attribute of effective user engagement, we hypothesise that user motivation has a direct impact on effective user involvement. We argue that when users are motivated to be engaged in the process of user involvement, their effectiveness will increase.

H5. There is a significant effect between User Motivation and User Involvement Success.

3.2.2 User-developer attitude

The nature of the relationship between users and developers of the system is a key factor that identifies and determines the shape of the outcome (52, 53). Managers should take care of the interactive nature that takes place between users and developers during the process of system development, especially in large-scale projects. Developers work as change-agent to interact with users in order to create the proper involvement which can achieve user satisfaction (54). The same study concluded that users' beliefs in different developers and their evaluation of the relationship between users and developers are associated positively with both user involvement and satisfaction. When users believe that developers and the project team (including the manager of the project) value and appreciate their opinions and input, they will realise the value of their involvement which leads to more user satisfaction. Even if they are given the right to participate, but they are worried about the attitude and reaction of developers, users will feel negative toward their involvement level, hence that will lead to less satisfaction with the system.

Ives and Olson (55) claimed that the developers' attitude toward users could be a critical source to examine the function of user involvement in the success of management information systems. Amoako-Gyampah and White (54) conclude that there is a significant relationship between attitudes of developers toward users with perceived user involvement.

Our study investigates the factors that impact effective user engagement; we observe that user-developer attitude influences the success of user engagement. So we have decided to study this factor based on the aforementioned finding concluded from the previous studies. Some researchers study the impact of developer attitude toward users on user involvement and user satisfaction, but other researchers suggest studying the beliefs and attitudes of users toward developers. Therefore we have chosen to study both attitudes under one term named user-developer attitude. We develop a hypothesis that there is a relationship between user-developer attitude and effective user engagement.

H6. There is a significant effect between Users-Developer attitude and User Involvement Success.

3.2.3 User attitude toward system

User attitude in information systems reflects a psychological condition that displays the feeling of users toward the new system (56). The correlation between user attitude toward system and user involvement is bi-directional. Users who have a positive attitude toward an issue are able to build confidence that the issue is personal, relevant, and important. Users with a positive attitude toward a system aim to be more involved in the development process (57). Hartwick and Barki (32) concluded that user involvement and user attitude toward a system contribute positively to encouraging users to participate in the development process. Hunton and Beeler (40) claimed in his model of "effect of antecedent conditions on desired participation" that if users believe in the importance and personal relevance of the existing system they will be

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motivated to participate in the development system process to improve the existing system. The same study concluded that there is a significant association between user involvement and user attitude, between user attitude and desired participation, and between user involvement and desired participation. Lin and Shao (11) stated that user attitude toward a system has a positive and significant effect on user involvement and that there is a positive effect of user involvement and user attitude on user participation.

We conclude that user attitude plays an important role singularly and combined with user involvement in encouraging users to participate in the information systems development process. Moreover, once the user's intention to participate increases, the process of user engagement will be more effective. So in this study, we aim to discover the relationship between user attitude toward a system and the effective user involvement.

H7. There is a significant effect between User Attitude toward a System and User Involvement Success.

3.2.4 Disagreement/conflict

Differences in goals, expectations, values, understandings, realizations, and lack of communications are considered attributes that contribute to conflicts or disagreements between project participants. In information system development, conflict may happen among the groups associated with the process of development such as users and developers and the team members of the project. Conflicts between participants negatively impact the process of system development. In contrast, another study suggests that conflict may impact positively, particularly if it motivates to build a meaningful dialogue that leads to address the debate issues in the best way and finally decide the right solution (33).

Constructive conflict model was produced to overcome problems that arise where more than one criterion exists, and where members have different goals (58). Constructive conflict model contributes to preventing domination and problems and produces solutions for them. On the other hand, destructive conflict decreases the cooperation and teamwork, generates hostility, and initiates classification as winners or losers (59). In constructive conflict model, user participation leads to conflict then resolves this conflict. Conflict and conflict resolution arise when users are able to participate in their influence during the process of development. In the same model, all the baths have a positive sign except conflict itself does not lead to conflict resolution. Furthermore, the higher the conflicts level is, the harder the resolution. In this model, conflict can be settled through participation and influence (59).

Based on our findings, conflict was studied as a result of user participation. Some researchers conclude that conflict affects the process of system development negatively. Other researchers suggest that it may be important to gain the best decisions from participants. The fact that conflict appears as a result of user participation is already known. But no researcher has studied the impact of conflict on effective user engagement. While we agree that conflict already exists when users are engaged, we should work to explore its impact and how we can overcome the negative result of conflicts. In this study, we aim to study the impact of conflict on effective user engagement. We hypothesise that there is a relationship between conflict and effective user involvement.

H8. There is a significant effect between Disagreement/Conflict and User Involvement Success.

3.2.5 Involvement congruence

Involvement congruence is the degree to which actual user involvement in system analysis activities matches their perceived level of involvement. In other words, it is the degree where the desired involvement matches the perceived involvement. When users are involved as much as they want in the process of information system development, the involvement congruence is high. In contrast, as the gap increases between perceived and desired involvement, the degree of involvement congruence decreases. Doll and Torkzadeh (21) conclude that congruence is a better predictor of end-user satisfaction with their perceived involvement. They suggest that developers and decision support systems should take care of user desires for participation.

The degree and level of user engagement refer to the level of effort and duration that users spend in the information system development process (55). If users are given the right to select, share opinions, and choose an option from pre-defined options, user engagement will contribute positively to system success. The reason behind that is once users give their opinions and choose options they anticipate that they will be implemented by developers. Thus, they contribute confidently which

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increases their satisfaction. Users who feel that they are part of the development team are more concerned about outcomes (16). We argue that when users are satisfied with their level of engagement during the process of system development which meets their expectation, the effectiveness of user involvement will be high. So, we hypothesise that involvement congruence has a significant relationship with user involvement.

H9. There is a significant effect between Involvement Congruence and User Involvement Success.

3.3 System Attributes

3.3.1 Complexity

The complexity of the system development process contributes positively to the relationship between user participation and system success (52, 60). The complexity has been used by researchers interchangeably with different concepts such as ambiguity and uncertainty. The complexity arises from unstructured tasks, involvement of subtasks, ambiguity, and uncertainty. Ambiguity arises from lack of understanding and disagreement. In contrast, uncertainty arises from the absence of important information (61, 62). Two types of complexity (task complexity and system complexity) are necessary for system development.

3.3.1.1 Task complexity

Task complexity arises from users' environment and is defined as the ambiguity and uncertainty that cover system practices and is related to decisions about different elements. For example, task complexity results from the number of available options and the interrelationships between options.

3.3.1.2 System complexity

System complexity arises from developer environment and is defined as the ambiguity and uncertainty that cover system practices and is related to decisions about different elements. For instance, system complexity results from the design technique, computing language, methodology, and the development team (35).

As the level of system and task complexity increase, the user participation-satisfaction relationship becomes stronger (35). System complexity significantly impacts user participation. The more complex information system is, the more user participation in the development process is needed (11). User involvement importance becomes more critical and essential where the system complexity is high. The reason behind that is once the complexity increases, system requirement will be difficult to identify. That will increase the possibility to build a wrong system. User involvement contributes to identifying the correct system requirements to build the correct system (16). Based on the aforementioned importance of complexity and its connection to effective user engagement, we aim to study it in our model. Furthermore, we hypothesise that there is a direct relationship between complexity and effective user engagement.

H10. There is a significant effect between System Complexity and User participation.

H11. There is a significant effect between Task Complexity and User participation.

H12. There is a significant effect between System Complexity and User Involvement.

H13. There is a significant effect between Task Complexity and User Involvement.

3.4 Organisational Factors

3.4.1 Top management support

Top management is defined as the group of decision-makers and senior executives who are responsible for all the organisation strategic directions. Many studies suggest that there is an important role for top management support in the process of information systems development and implementation which contributes to project success. Top management support is considered essential to improve the attitude of users such as encouraging users to participate in the project or controlling any users' negative feelings toward the new system (33). In addition, it is capable of distributing and allocating various resources in the best way and making the suitable agent change to initiate a conducive environment that is contributing to an information systems success. For instance, the management takes care of the advantages that can be gained when using the system, motivates users to use the system to accomplish their work tasks, and offers the essential help and needed resources that allow people to use the system. Furthermore, the management seeks permission to access hardware and software resources once people need them (63). Santhanam, Guimaraes (64) concluded that management support and user participation have a significant correlation with three success factors:

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perceived benefits, user satisfaction, and job impact.

Management support and user involvement have a significant effect on user satisfaction, and user satisfaction positively impacts individuals and organisations (64). Abelein and Paech (8) in a systematic-analysis study recommended studying user participation with the context of top management support. Bano, Zowghi (22) concluded that management support plays a critical role in motivating users to participate and be involved in the process of information systems development. These benefits of top management support, which are concluded from literature review, highlight the importance of investigating top management support factor in our model. Especially when we find that top management support is connected with user engagement factor and both of them affect user satisfaction which is one of the system success factors. Additionally, researchers recommended studying top management support with user engagement factors. Hence, we hypothesise that there is a relationship between top management support and effective user engagement.

H14. There is a significant effect between Top Management Support and User Participation Success.

H15. There is a significant effect between Top Management Support and User Involvement Success.

3.4.2 Organisational or managerial culture

Culture is the mind programming that differentiates a group of human from another (65). To be specific, it is a set of assumptions that are explored, initiated, and deducted by a given group to deal with internal and external problems. These assumptions work well and can be valid to be taught with the new members as a standard way to think and deal with the problems (66). The organisation culture depends on exchanging the ideas and values (67). It may reflect the norms and values accepted, which influences the user-developer interactions or cooperation between inter-departments. For example, the culture of the organisation encourages communication and conflict settlement (33). The organisation that has a culture classified as flexible is able to cope with unexpected events better than the culture which is classified as inflexible. User involvement is an element of organisational culture which is related positively to user satisfaction (68).

The management activities, related to the involvement of users in information system development, reflects the culture of the organisation and how they deal with their human resources (31). Bano, Zowghi (22) observed that organisational culture, availability of users, user motivation, and complexity of the project could be critical factors for choosing the best user involvement. Moreover, when the level of user participation increases in decision-making, the organisation culture becomes more democratic. From the literature and the list of benefits discussed above, we determine that there is a relationship between organisational culture and effective user engagement. So, we will explore the shape of the relationship between them and study culture factor in our model.

H16. There is a significant effect between Managerial Culture and User Participation Success.

H17. There is a significant effect between Managerial Culture and User Involvement Success.

3.5 Relation between User Participation and User Involvement

McKeen, Guimaraes (35) summarised the theoretical models in information system development that are related to user participation area and how they are developed. The basic model of user participation claimed that there is a direct relationship between user participation and system success. But because other studies did not show a high predictive power based on the basic model, a refined model was proposed with the new component named user involvement between user participation and system success to increase the predictive power (7, 69). Later, Hunton and Beeler (40) concluded that there is a positive relationship between user involvement and desired participation. Based on these studies, we hypothesise that there is a bi-directional relationship between user participation and user involvement.

H18. There is a significant effect between User Participation and User Involvement.

H19. There is a significant effect between User Involvement and User Participation.

Figure (1) shows the A-Priori model of user engagement success in information systems development.

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3.6 Theoretical Contribution

The theoretical contributions of this study are as follows:

1. Identify user engagement as an important factor for information system success.
2. Verify that user participation and user involvement are factors which are defined user engagement.
3. Identified 11 sub-factors that are contributing in success user engagement.
4. Introduced a-priori model for user engagement success.

3.7 Practical contribution

The practical contribution of this study is to approve that user must be engaged in the information systems development. In addition, the practical contribution is directed to vendors, managers, and practitioners of information systems to avoid failures by engaging users in the development of information systems.

4 CONCLUSION

In this paper, 11 factors are derived based on content review and mapping. It investigates the the relationships between Group Factors: Development Process, Human Aspects, Organisational Factors, and System Attributes on engaging users successfully in the information systems development process.

Both development process activities and user participation activities take place during the development process of information systems, so development process factors (user-Developer communication, Identifying Members, User Ability in IT Projects) will be examined in the success of user participation process. In addition, the researcher examines the relationship between Identify the correct participants and their level of ability in IT projects

User involvement success is based on the psychological aspects of the people who are involved in the information systems development; hence, we examined the Human Aspects factors (User Motivation, User Attitude toward System, User-Developer attitude, Disagreement/Conflict,Involvement Congruence) in the success of user involvement.

As a System Attribute, complexity has *a* significant relationship with user participation. Although complexity was used as a general term, in this study we differentiate between system complexity and task complexity. So we will examine the relationship between both system and task complexity with the success of user participation and user involvement.

Organisational factors (Top Management Support and Organisational or Managerial Culture) have been often examined in the field of information systems success. Because of the strong relationship between the success of user engagement and information systems success, both Management Support and Organisational Culture will be examined to recognise their contribution to the success of user participation and user involvement.

The a-priori model presented in this paper is a conceptualisation on of how user engagement in the information systems project development can lead to successful IS projects. The a-priori model will then be validated at higher eduacation organisations in malaysia by first conducting expert interviews to set feedback on the factors and also identify other relevant factors that may not be identified for this content review activity. The a-priori model will then refined based the feedbacks from the experts. Second, a quantitative survey will be conducted to validate the model.

The current model that is built in this paper is not enough at this stage. The selected factors will be discussed with experts in the field of information systems development. The model will be refined according to the interviews result. At this stage, A pre-testing for the selected factors was conducted with 7 of students who have experience in information systems development, and most of them informed that all factors are important and covered all the aspects of user engagement.

5 Limitation

In literature, we did not find obvious factors that have a direct relationship to user engagement success. Therefore, we have selected the factors that have been studied with any issue of user engagement constructs (user participation and user involvement), and the factors that play as moderating variables between the user engagement constructs and success of information systems.

6 Future Work

The exploratory case study (interviews with experts) phase will be applied to justify the a-

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priori model factors. The outcome of this stage will be a refined conceptual cause and effect of success user engagement model. Then, a survey instrument will be designed, distributed, synthesised, and analysed for specifying and validating the refined model in advance. Finally, the whole results of the literature review, the interview with experts, and the survey will be integrated, analysed, interpreted and reported.

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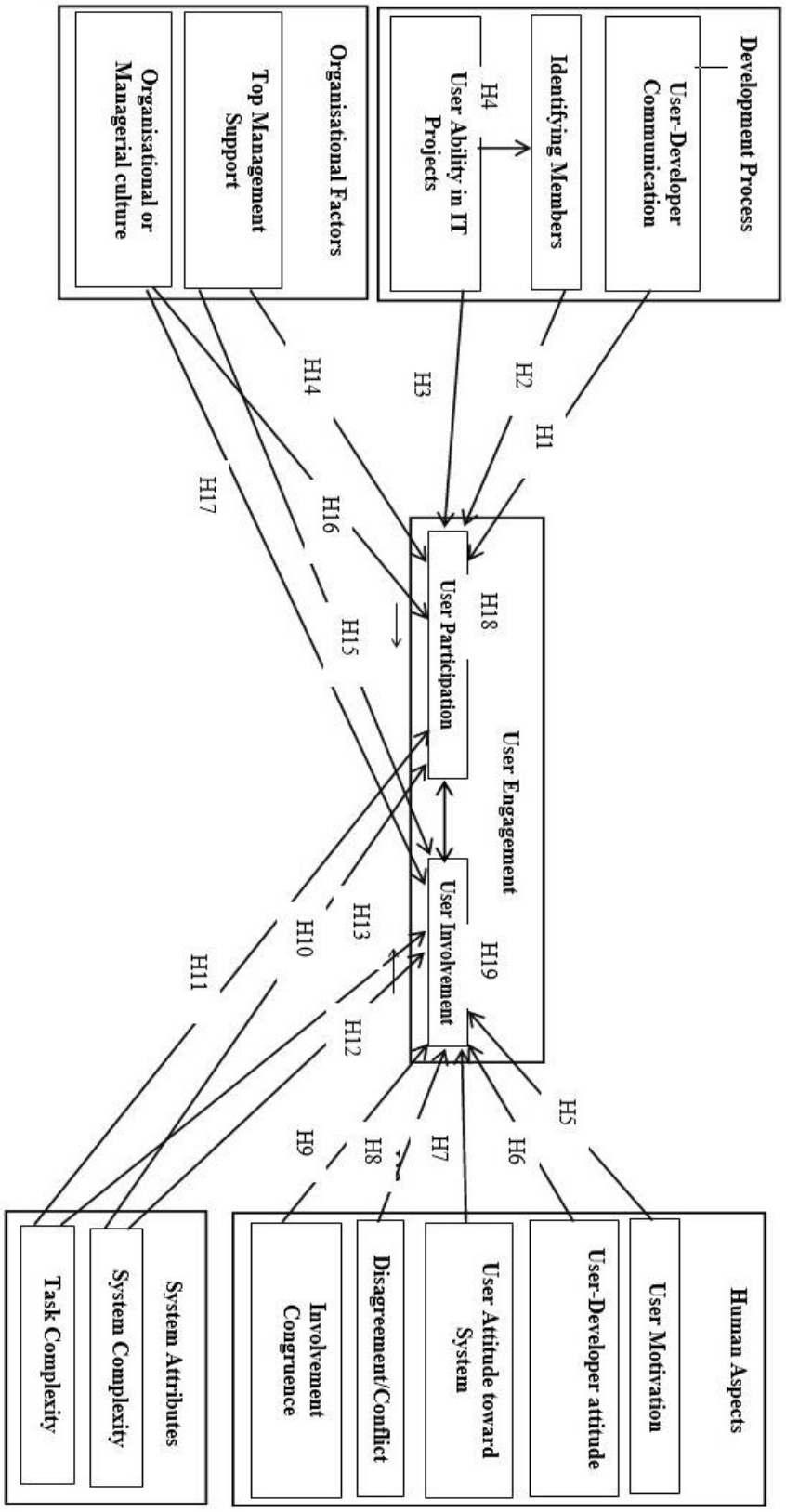

Figure 1: A-priori Model of User Engagement Success in Information Systems Development