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Evaluating and Improving the User Experience (UX) of Organization Workflow

Abrar Mubarak Munef[1], Wajdi Al Jedaibi[2], Emad AlBassam[3]

Department of Computer Science, Faculty of Computing and Information Technology,

King Abdulaziz University, Jeddah, 21589, Saudi Arabia[1,2,3]

Abstract: User Experience (UX) is becoming popular as a necessary success factor across many sectors and organizations, including the software development industry such as a workflow management system. This system is important to deal with complex needs of organizations to control and organize their routine processes and to manage it in a better way. To assess the performance and the quality of the workflow system, it is essential to evaluate UX using different criteria as UX tries to fulfil the user's needs. This research aims to provide a framework to assess the user experience of using workflow management system from multiple perspectives such as (i) Ease of Use, (ii) Ease of Learning, (iii) System Usefulness, (iv) Informational Quality, (v) Interface Quality, and (vi) Overall experience. In addition, the framework validated using real case scenarios to assess the current state of UX for the organization's workflow systems. The collected responses analysed using different statistical techniques to understand the performance of the proposed model. The results suggested a high level of correlation among evaluation criteria, whereas Cronbach Alpha, and Split-Half Reliability Test shows the excellent performance of the model in evaluating the UX criteria. The research is helpful for the organizations to assess the quality and use of workflow management system from the user's perspective.

Keywords: User Experience, Organization Workflow, User Experience Evaluation, User Experience Criteria.

I. INTRODUCTION

Nowadays, User Experience (UX) has become more important and popular as a success factor across many sectors and organizations. It is the result of the interaction of the user, system, and context. The word "experience" means all aspects of how users use an interactive product [1] such as (i) The way they feel in their hands, (ii) How they understand how it works, (iii) How they feel about it while using it, and (iv) How to serve their purposes and its appropriateness in the entire context in which they use it [2]. i.e., the experiential, affective, meaningful, and valuable aspects of product use [3]. In the context of UX, it is a series of events over time during a user's interaction with the software product [4]. The workflow system in any organization is described as the set of processes, resources available, the people required, and the interactions among them necessary to accomplish a given organizational goal [5], upon which evaluation of the user experience for the organization workflow system was needed.

Measuring and Evaluation UX is important for the purpose of having a good system or service. It could give additional ideas to users' perception of the particular criteria of the system [1]. UX has been evaluated using a variety of criteria such as effectiveness, efficiency, ease of use, and ease of learning, and others. By evaluating, the researcher can recommend the requirements needed in developing and improving a system. It focuses on selecting the most excellent design to ensure the development and improvement of the software is in the correct direction, and fulfilling the users' needs [1], [6]. The extent of the user experiences a range of human reactions that would be measured to include pleasure. And the circumstances under which they would be measured to include anticipated use and consideration of use. [7]. The lifecycle of UX has three levels: before, during and after interacting with the system, the goal to achieve improved user experience focus on measurement and evaluating the system after interaction.

According to the findings in this study, users of a workflow system in an organization faced some difficulty in searching for information, follow up or tracking specific transactions or complete the tasks that need to be completed within the system. In addition, lack of a proper and clear data organization framework also makes information gathering from the system quite difficult. All these lead to the complexity involved in the use of the system and reduce the user productivity. Based on the above problem statement the main objective of this study is; to understand the user experience process, and evaluating the criteria for an organization's workflow management system.

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II. RELATED WORK

A. User Experience (UX) Process

UX has been defined as the value provided to users when they use products or services. On the other hand, UX design is the process undertaken to enhance user satisfaction with products and services by improving accessibility, usability and the pleasure provided while transacting with the product or service [8]. However, developing UX to the ultimate level of user satisfaction is not the responsibility of a single person of a single team; rather, explains that it is the organization's overall vision [9]. UX process is defined as an iterative method that facilitates the continuous improvement of designs by incorporating user feedback [10]. User feedback must be used as much as possible at every phase of developing the UX design. A UX design process will entail a similar approach as that adopted in design thinking consisting of five phases which empathize with users (this involves learning about the users); defining the problem (this involves identifying the users' needs); ideating (this involves generating design ideas); and prototyping (this involves transforming ideas into practical examples) [11]. However, despite the standardized phases, the UX process will necessarily differ from project to project, organization to organization and designer to designer depending on factors such as nature of the project, deadlines, client, and experience of the UX designer. The expanded definition of UX process to six phases as highlighted below [12]:

- Understand: the designer should understand requirements so as to create user personas and define use cases
- Research: the designer must analyse competitors, research the latest UX trends and observe guidelines
- Sketch: the designer gathers ideas, draws sketches and wireframes, and then evaluates and re-draws them
- Design: the designer designs images, creates prototypes, and defines the UX guidelines
- Implement: the functionality is implemented and experience built.
- Evaluate: the designer performs usability testing, creates audit reports, and identifies improvements.

B. User Experience (UX) Evaluation

UX evaluation is defined as the collection of tools, methods, and skills used in uncovering the way users perceive products, services and non-commercial items (or even a combination of these three also known as a system) before, during and after they interact with them [13]. Another study [9] pointed out that evaluating UX is complex because of its subjective nature besides the fact that it is dynamic over time and context-dependent. The importance of improving UX evaluation is that the more sectors mature, the more they take for granted the technical reliability and usability of their products. According to [14], this forces consumers to start looking for alternative products that offer them more engaging UX. Therefore, in order to retain customers and attract new ones, it is imperative that businesses evaluate UX accurately and meaningfully enough for them to be able to provide more engaging UX [8].

As noted in [9], UX is understood in general terms as being inherently dynamic and this is associated with people's ever-changing emotional and internal states and the differences in their circumstances before, during and after they come into contact and interact with a product. Thus, it is not accurate to simply view UX as a concept to be evaluated after interacting with a product; rather the evaluation should also be before and during the interaction. On one hand, it is important to evaluate short-term UX mainly in consideration of the dynamic changes in their needs and goals related to contextual factors. On the other hand, [15] also pointed out the importance of knowing how and why UX evolves over time. Further, the users' values influence their UX with products and services, hence the importance of considering this relationship in the design process. From the above assertions, it is inferred that looking beyond static aspects and investigating temporal aspects of UX (i.e., to understand how UX changes over time) is important in UX evaluation.

The most common approaches towards UX evaluation include methods such as Attribute Analysis; Formal Experiment; Question or Survey; and the Goal/Question/Metric (GQM) Paradigm [16]. The attribute analysis method entails a heuristic analysis that focuses on usability whereby experts compare the design of a digital product to a list of predefined principles to identify areas in which the product does not follow those principles (the name heuristics is derived from the list of principles) [16]. However, [17] criticized this method and argues that traditional usability evaluations are essentially different from UX evaluation. In explanation, they point out that while the emphasis of usability is on efficiency and effectiveness, UX additionally entails hedonic attributes besides the pragmatic ones and this makes it subjective. However, another research argued that while the objective measures such as the number of clicks, errors or time spent on executing a task are not valid UX measures, it is important to consider them to understand the user's feeling about using the product [16]. This is because user expectations and motivation affect their experience more than in conventional usability.

C. Elements of User Experience (UX)

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When one interacts with a website, several decisions are made while they surf and the decisions are usually in consideration of all the actions the user can make. Therefore, users can be motivated to continue using and interacting with the website (or product) when their experience is enhanced and their needs satisfied [18]. According to [19], the decisions made by the system are built upon each other whereby they inform and influence the aspects of UX. Although the elements are numerous, they can comprehensively be compressed into five, namely strategy, scope, structure, skeleton and surface. Each element depends on the one directly below it and every decision made at one layer will affect the decision on the subsequent layers. The strategy element entails the reason for the website, product, or application, why it is created, who it is targeting, why the target audience is willing to use it and why they need it [20]. The goal of this element is to define business objectives and user needs and it can be achieved via a strategic research process using interviews to review competing organizations or products. The scope element defines the content and functional requirements that must be aligned with the strategic goals to fulfil them. As described by [12] the content requirements as the information (videos, images, text, audio, etc.) needed to provide value without which it will be difficult to estimate the magnitude of the project and the time required to complete it. Functional requirements are the requirements related to how the features of the product interrelate and work with each other. Ideally, the users need the features to accomplish their objectives. In contextualizing content versus functional needs [12], for example the feature could be having a media player to play songs on one hand and the content, on the other hand, are the audio files for the songs.

The user-product interaction, the way the system behaves when a user interacts with it is defined in the structure element, and the way it is organized and prioritized [5]. This element is divided into two components, Information Architecture and Interaction Design. Given the functional requirements, the interaction design defines the way a user can interact with the product and how, in turn, the system behaves in response to such interactions. Information architecture, also given the content requirements, defines how content elements are arranged and organized in order to facilitate human understanding. A good interaction design will help users achieve their goals as it communicates functionality and interactivity effectively. It also informs users on state changes such as files that have been saved while they interact. It helps prevent user errors such as when the system prompts a user to verify potentially risky actions such as a deletion. On its part, good information architecture will organize, categorize and prioritize information basing on business objectives and user needs. It makes it easy for the user to understand and surf through the information presented to them.

D. User Experience (UX) Criteria

The common criteria used to measure UX are satisfactions, usability, ratings, user tasks and product description. According to [13], it is important to capture ratings as well as the reasons for the ratings. User satisfaction described by [11] considered the most relevant criteria of UX and this is based on the almost obvious assumption that a bad experience is not likely to make users satisfied. According to [21], users in the real world will more likely talk of their frustrations as opposed to how satisfied they are. Thus, a practical approach would involve asking them to rate their experiences using, say, a 5-point Likert scale ranging from very dissatisfied to very satisfied. Surveys are also considered an effective way of capturing satisfaction ratings along with the feedback provided when using a website or within an application. The usability criteria describes how easily users can accomplish the tasks they set out to do. Although [19] argue that usability may not be the differentiator it once was, they acknowledge that it is still important to a product's UX and this is because a product that is difficult to use will not provide great UX. A practical approach to capturing overall usability is to ask the users how ranging from extremely hard to use to extremely easy to use, they would describe a product. Thus, in contrast with the view presented by [19], [22] opine that usability is a key UX criteria. System Usability Scale (SUS) has been used commonly to measure usability and it comprises 10 questions asked to product users or following the procedures of usability testing. The score is considered the most useful for purposes of benchmarking usability and this could be historical as in relative to a product before change or against similar products. However, [22] also caution that SUS is not a percentage despite the fact that the score is out of 100. Rather, it is a relative scale that should be applied with care.

Another criterion is engagement this may be considered important for most websites but is characteristically an ambiguous category [17]. However, [23] argue that UX teams can make real contributions towards understanding the degree to which users interact with a website, the attention they pay to it, the amount of time spent in a flow state, and how good they eventually feel about it. Although time remains an important factor in engagement criteria, it must be used alongside other categories such as event streams, page views, or scrolling at certain intervals. Further, because engagement is a tricky category to read, it generates better results when used in combination with qualitative insights [13]. Rating criteria provide a way of judging the quality of a product and users can be asked to provide overall ratings along with ratings for a product's different features. A 5-point scale is acceptable but it also important to capture the reasons for the ratings [16]. Users may be asked to rate, for instance, the entire website or specific aspects of its features. Tasks are considered to be at the core of a product because products that do not support user tasks are not expected to provide a great user experience [24]. According to [25], criteria for user tasks need to be captured immediately after the

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user has attempted a task and this generally implies following usability testing. However, it is also worth noting that user task criteria may also require focusing on a number of tasks such as completion rate, error rate, the average number of errors, time spent on tasks and the ease of completion. Effectiveness criteria describe the completeness and accuracy with which a user can achieve a specified goal and can be calculated by measuring the completion rate. Grudin (2017) explains that with regards to speeds and errors, the essential scope of tasks has to be completed at a level better than some level of performance required [9]. Users must be able to use a system after a given time period of proper training or first self-usage. According to [22], Learnability is a measure of the degree to which a user interface can be learned not only quickly but also effectively whereby the typical measure is learning time. It has also been established that user interfaces are easier to learn when they are designed to be user-friendly based on fundamental psychological properties and when they are familiar.

III. PROPOSED FRAMEWORK AND EXPERIMENTAL DESIGN

In this study, the proposed framework is to conduct an empirical experiment of workflow system at Saudi public organization to evaluate and assess the current state of user experience (UX) for the workflow system. We identified a preferred UX criteria and analysed their weaknesses based on the survey study. In addition, the relationship between UX criteria to fulfil user satisfaction is understood to suggest improved UX criteria and apply the suggested criteria on an existing workflow system. Our proposed framework is explained in following two sub-sections (A & B):

A. Identification Phases of Criteria

To identify the criteria our study was conducted in various phases:

- **Discover phase for defining proposed criteria.** First of all, we study the user experience of an organization workflow system from the previous user experience criteria and studies (as discussed in previous section) that can be preferred criteria for workflow system. We classify the proposed criteria according to the ease of use, ease of learning, system usefulness, informational quality, and interface quality.
- **Testing phase for analysing potential solutions.** Then, we took into account those aspects that can be potential problems for users using a workflow system. Also gathering opinions of previous experiences from the authorities concerned with (responsible for) the system. For this purpose, we analysed an existing workflow system, to conduct an empirical study.
- **Empirical phase for identifying issues.** Then, according to those aspects we collected feedback from a number of employees through a distributed survey to discover preferred UX criteria to solve the problems identified.

B. In depth review of an organizational workflow system

Our empirical experiment of workflow system is related to the Request Management System (RMS) at King Abdulaziz University as a representative Saudi Public Organization. We choose this organization workflow system because of the many different fields, categories, and functions that are found in most other organizations, such as administrative, faculty, doctor and others, and different positions like Head of Department, Vice/Deputy, manager, Supervisor and Employee. It is one of the leading universities in the Kingdom at the local and regional level. The workflow system at the organization is powered by various technologies. Various support systems have therefore been developed to aid in information management through the use of singular centred solutions. The software is implemented in various departments within and integrated into one single system for effective management. The integration used in the departments allows seamless information flow within the university across the departments. Operations at the university are greatly enhanced through the application of technologies that enable real time communication. The workflow system enables receiving and transferring incoming transactions to entities or persons and viewing confidential transactions attachments, also inquiry reports showing the incoming and outgoing for each department during specific time periods and the completion rate. Some of the negative impacts include the fact that the design is not responsive. As shown in Fig. 1 and Fig. 2, it does not fit all screens thus creating multiple problems for the users. The elements of the interface are not compliant with the acceptable standards, and the information is not labelled or categorized clearly.

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Fig. 1 Appearance of Request Management System (RMS) on Various Devices-I

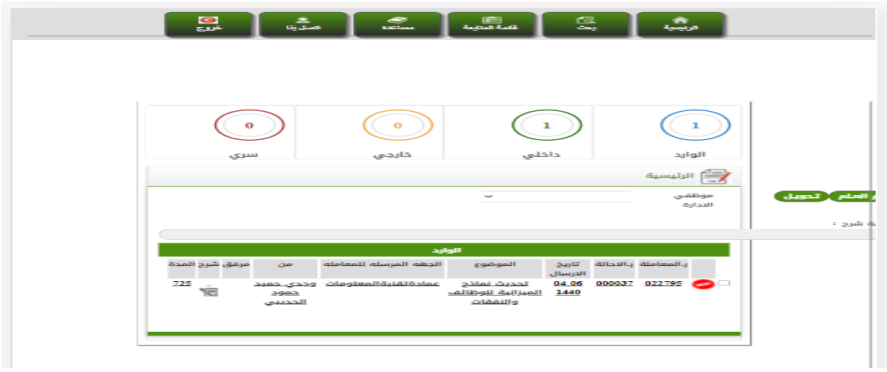

Fig. 2 Appearance of Request Management System (RMS) on Various Devices-II

Secondly, completing tasks is complex as per the experience of using this workflow system. In Fig. 3 and Fig. 4 users find it quite difficult to complete the tasks that need to be completed within the system. It is not clear what are the consequences of various actions, thus creating a lot of confusion; also, it is quite difficult to insert description or comments to the transactions. Another negative impact is the fact that viewing several pages is not straightforward. Viewing the department's or section's referrals is a difficult affair.

Fig. 3 Completing Task Page-I

Fig. 4 Completing Task Page-II

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Fig. 5 and Fig. 6 illustrates a major problem when searching for information because the function is not practical, and it is hence ineffective. So, making follow-up or tracking the transactions after they have been made are difficult because this leads to a poor flow of information. The fact that it is quite difficult to track the transactions contributes to the overall difficulty of the system Lack of a proper and clear data organization framework should also make information gathering from the system quite difficult. Finally, the complexity experienced in the use of the system reduces the user productivity and satisfaction.

Fig. 5 Follow-up the transactions

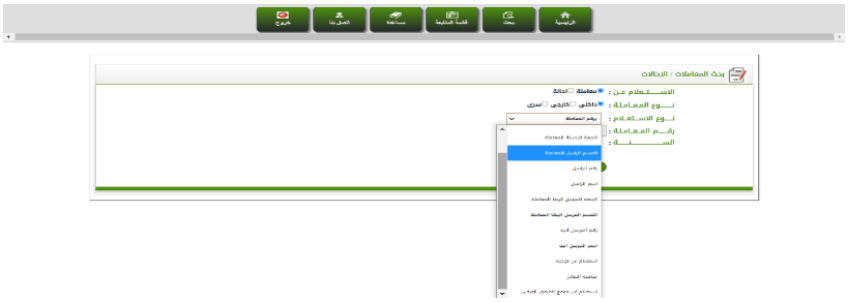

Fig. 6 Search Function

C. Survey Study

I. Survey Development

The web-based electronic forms are used to get the responses to the survey. The benefits of using web-based electronic forms include the efficiency of data collection and it is easier to use the online forms to reach a number of individuals in the target population and easier to collate and analyse the results. The survey consists of closed-ended questions, which are formulated based on the objectives, research question and the review of the organization workflow system. The questions were organized into two groups: the first contained 5 demographic questions, 2 multiple choice questions about the most issues that users experienced in the workflow system and the frequently used actions gathering opinions from the authorities concerned with (responsible for) the system, while the third group of questions was organized into 6 sections. Each section in the third group represents different criteria in 29 questions as shown in Table 1. Finally, the last question represents their opinion about the overall workflow system.

TABLE 1 QUESTIONS RELATED TO CRITERIA

Sections	Criteria	Questions Number	Percentage
1	Ease of use	Q8-Q9-Q10-Q11-Q12-Q13-Q14-Q15	26.67
2	Ease of learning	Q16-Q17-Q18-Q19	13.33
3	System Usefulness	Q20-Q21-Q22-Q23-Q24	16.67
4	Informational Quality	Q25-Q26-Q27-Q28-Q29-Q30-Q31-Q32	26.67
5	Interface Quality	Q33-Q34-Q35-Q36	13.33
6	Overall	Q37	3.33

The questions are used in multiple choice type format to measure the respondents and scale from 1-5. Whereas, 1 means strongly disagree and 5 means strongly agree, I don't know is associated with 0. The Likert categorical scale is used to give a weight for each answer from low to a high score as shown in Table 2.

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TABLE 2 LIKERT CATEGORICAL SCALE

Weighted Mean	Possible Answers
From 0 to 0.83	I don't Know
From 0.84 to 1.66	Strongly Disagree
From 1.67 to 2.49	Disagree
From 2.50 to 3.32	Neutral
From 3.33 to 4.15	Agree
From 4.16 to 5	Strongly Agree

II. Sample Selection

A sample was selected based on the Deanships in Saudi Public organization. The population sample included people who used the workflow system with different positions in the organization at King Abdulaziz University. The respondents already have practical experience in using the workflow system.

D. Data Collection

The respondents were given access to the online survey using the web services forms. The responses of the survey are collected from the period of 8th April 2019 until 13th September 2019. The data has been recorded and updated simultaneously as responses are received. The answers have been exported as an excel sheet and organized in the SPSS spreadsheet with the code sheet that has been improved rely on the Likert categorical scale to evaluate the attitudes from the data of the survey results. The answers are organized into separate rows and columns with the allocated attitudinal score. The answers to each question have been assigned with numerical values for the data analysis.

E. Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to analyze the survey data, which is a statistical analysis software that also supports data management and documentation. The application can be used for various statistical methods including descriptive statistics, bivariate statistics, cluster analysis, and linear regression [26]. The main statistical analyses are correlation and mean that have been implemented include overall multi-dimensions of each criterion. To provide valid and reliable answers of the survey, the Cronbach Alpha and Split-half are computed and the Validity Pearson product-moment correlation coefficient is used. The line charts are provided for the clarification percentage of frequency and predict the relationship between each criterion. Other information was organized in the pie chart for the first group of general questions and the bar charts for the second group.

IV. RESULTS AND ANALYSIS

A. Demographic Question's Result

The demographic questions offered two personal questions such as gender and age, and three questions related to the job such as years of experience, the position, and the field of the organization to ensure in-depth information is provided. The last two questions in this section are related to (1) if participants had experienced an issue in an organization workflow system such as (Design not responsive, information is not labelled or categorized, completing tasks is complex, search function is not practical, insert description or comments to the transactions are difficult), and (2) the tasks the participants usually do such as (receiving and transferring transactions, creating transactions, activating and determining the permissions of the communications staff, inquiry and search about the transactions, print reports and follow up the transactions).

I. The Gender Question

Fig. 7 shows the percentage of participants' gender, which illustrates that there were 89.5% were males and 10.5% were females participated.

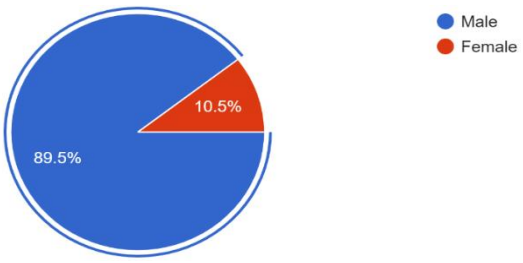

Fig. 7 The Percentage of Participants Gender

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II. The Age Question

Fig. 8 shows the percentage of participants based on their age group. The highest percentage is 29.8% for the participants belonging to (30-34 and 35-39) years of age. And the lowest percentage is 7% for the people belonging to age under 30 and ranges between 45-49 years of age.

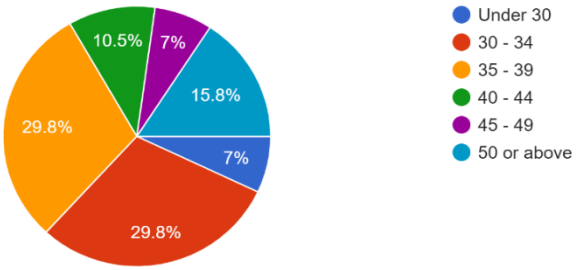

Fig. 8 The Percentage of Participants Age

III. Years' Experience Question

Fig. 9 illustrates the participant's years of practical experience in using workflow systems. It shows that most of the people having 5 to 9 years of experience consist of 33.3% of the total participants. On the other side, 31.6% participants had 10-14 years of working experience.

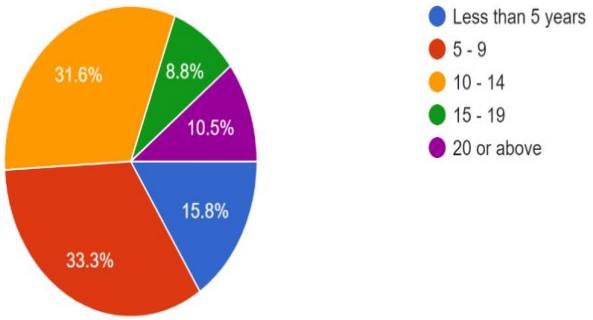

Fig. 9 The Percentage of Years' Experience of Participants

IV. Organization field Question

Fig. 10 shows the percentage of the field of organization the participants work on, which shows the participant work on Computer Information Technology and Education field. The highest percentage is 73.7% for Computer Information Technology followed by 26.3% for Education.

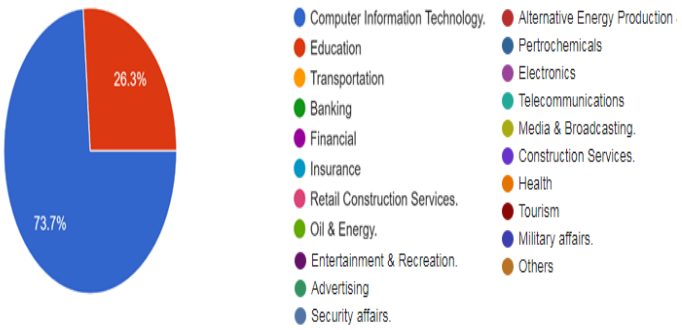

Fig. 10 The Percentage of the Field Organization

V. Participants Position Question

Fig. 11 shows the percentage of years of practical experience in using the workflow system, which the highest percentage is 33.3% for (5-9) years' experience.

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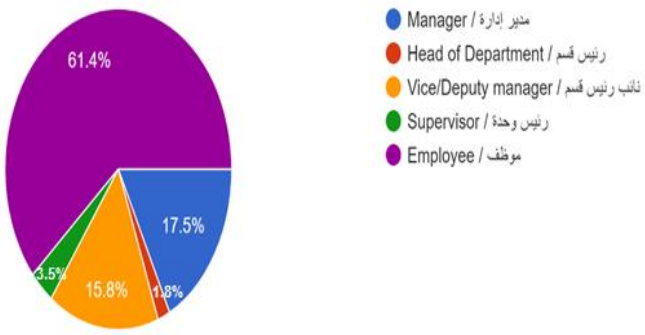

Fig. 11 The Percentage of the Participants Position

VI. The participants experience Question

Fig. 12 represents the number of participants that experienced one or more of the lists shown in Table 3. It was found that 30 participants see the design is not responsive (does not fit all screens). Then, 28 participants have difficulty in Search Function is not practical. Also, 25 participants experienced the follow-up or tracking the transactions after transfer are difficult and Information is not labelled or categorized clearly. In addition, at least 22 participants have difficulty viewing the department's/section's referrals and 21 participants faced viewing several pages is not straightforward and interface elements are not following the normal standard.

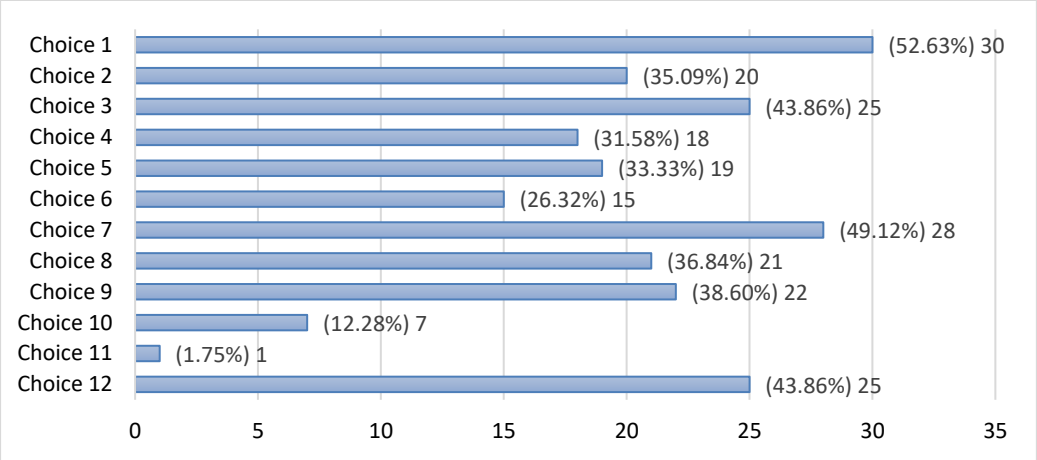

Fig. 12 The Percentage of Participants Experience Question

TABLE 3 LIST OF PARTICIPANTS EXPERIENCED IN WORKFLOW SYSTEM

Choice No.	Participants' Experienced
Choice 1	Design is not responsive (does not fit all screens).
Choice 2	Interface elements are not following the normal standard.
Choice 3	Information is not labelled or categorized clearly.
Choice 4	Completing tasks is complex.
Choice 5	The consequence of actions is confusing.
Choice 6	The system does not send me notifications.
Choice 7	Search Function is not practical.
Choice 8	Viewing several pages is not straightforward.
Choice 9	Viewing the department's/section's referrals are difficult.
Choice 10	Insert description or comments to the transactions are difficult.
Choice 11	Transfer the transactions is complex.
Choice 12	Follow-up or tracking the transactions after transfer are difficult.

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VII. Frequently used actions Question

Fig. 13 shows one or more of the frequently used actions of participants shown in Table 4 List of frequently used actions in the workflow system. Also, the table shows the percentage of each actions.

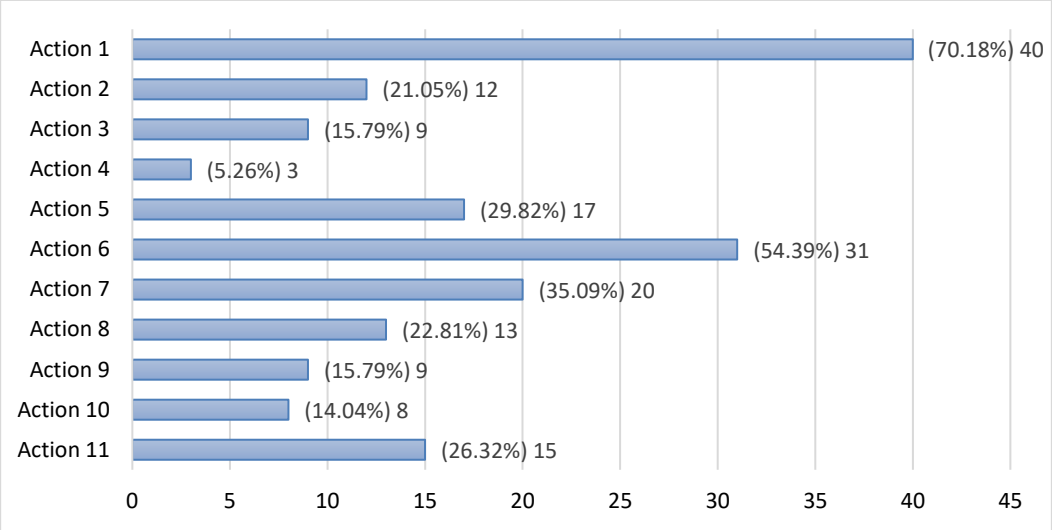

Fig. 13 The Percentage of Frequently used Actions Question

TABLE 4 LIST OF FREQUENTLY USED ACTIONS IN WORKFLOW SYSTEM

Action No.	Frequently used actions
Action 1	Receiving and transferring incoming transactions to entities or persons and viewing attachments.
Action 2	View confidential transactions attachments for employees who have been sent to them.
Action 3	Activating and determining the permissions of the communications staff in the department based on the type of transaction.
Action 4	Export the transactions by barcode for trading and recognize it.
Action 5	Create transactions within the agency and direct them to employees to accomplish the tasks assigned to them and follow them.
Action 6	Inquiry and search about the transactions in more than one way with printability
Action 7	Inquiry about the personal transactions outgoing and know the action taken by the persons transferred to them
Action 8	The ability of follow-up transactions and knowing what has been done with the possibility of exporting them to Excel file.
Action 9	Print reports showing the incoming and outgoing for each department during specific time periods and the completion rate.
Action 10	Follow-up the job performance for departments or employees during a specific period and know their status, with the possibility of exporting the reports to Excel file.
Action 11	Reports (Follow up the transactions of employees and know the status and the time spent on completed transactions).

B. UX Criteria Questions

This section represents the results of the survey were analysed based on calculating the mean, standard deviation, and correlation coefficient. Each table represents different criteria in 30 questions with the results of criteria analysis based on their opinion about workflow system which contains frequency(F), percentage (%), criteria(C), question(Q), measure(M), the responses from "I Don't Know to Strongly Agree", question mean (Q-Mean), criteria mean (C Mean) and Total result in percentage (Result %).

I. Ease of use criteria question

Table 5 shows ease of use criteria practices that are covered by questions from 8 to 15. The mean values of all practices range from (2.84) to (3.52), so the result of ease of use criteria is 66%.

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C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
Ease of use	Q8	F	-	5	5	20	17	10	3.386	3.3004	66%
		%	-	8.8	8.8	35.1	29.8	17.5			
	Q9	F	1	3	7	15	21	10	3.438		
		%	1.8	5.3	12.3	26.3	36.8	17.5			
	Q10	F	1	4	1	24	12	15	3.526		
		%	1.8	7.0	1.8	42.1	21.1	26.3			
	Q11	F	2	3	3	20	17	12	3.456		
		%	3.5	5.3	5.3	35.1	29.8	21.1			
	Q12	F	2	3	5	20	16	11	3.368		
		%	3.5	5.3	8.8	35.1	28.1	19.3			
	Q13	F	1	4	12	16	14	10	3.193		
		%	1.8	7.0	21.1	28.1	24.6	17.5			
	Q14	F	2	7	13	16	14	5	2.842		
		%	3.5	12.3	22.8	28.1	24.6	8.8			
	Q15	F	2	2	12	16	17	8	3.193		
		%	3.5	3.5	21.1	28.1	29.8	14.0			

TABLE 5 EASE OF USE CRITERIA ANALYSIS

II. Ease of learning criteria question

Table 6 shows ease of learning criteria practices that are covered by questions from 16 to 19. The mean values of all practices range from (3.42) to (3.54), so the result is 69.21%.

C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
Ease of learning	Q16	F	2	4	5	13	21	12	3.456	3.4605	69.21 %
		%	3.5	7.0	8.8	22.8	36.8	21.1			
	Q17	F	1	3	7	11	23	12	3.543		
		%	1.8	5.3	12.3	19.3	40.4	21.1			
	Q18	F	1	3	5	19	20	9	3.421		
		%	1.8	5.3	8.8	33.3	35.1	15.8			
	Q19	F	1	4	5	18	18	11	3.421		
		%	1.8	7.0	8.8	31.6	31.6	19.3			

TABLE 6 EASE OF LEARNING CRITERIA ANALYSIS

III. System usefulness criteria question

Table 7 shows system usefulness criteria practices that are covered by questions from 20 to 24. The mean values of all practices range from (3.07) to (3.43), so the result is 65.26%.

TABLE 7 SYSTEM USEFULNESS CRITERIA ANALYSIS

C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
System Usefulness	Q20	F	2	3	7	17	19	9	3.315	3.2632	65.26 %
		%	3.5	5.3	12.3	29.8	33.3	15.8			
	Q21	F	2	4	7	15	21	8	3.280		
		%	3.5	7.0	12.3	26.3	36.8	14.0			
	Q22	F	1	4	7	14	19	12	3.438		
		%	1.8	7.0	12.3	24.6	33.3	21.1			
	Q23	F	4	8	4	14	18	9	3.070		
		%	7.0	14.0	7.0	24.6	31.6	15.8			
	Q24	F	2	6	6	17	16	10	3.210		
		%	3.5	10.5	10.5	29.8	28.1	17.5			

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IV. Informational Quality Criteria Question

Table 8 shows informational quality criteria practices that are covered by questions from 25 to 32. The mean values of all practices range from (2.85) to (3.19), so the result is 60.53%.

TABLE 8 INFORMATIONAL QUALITY CRITERIA ANALYSIS

C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
Informational Quality	Q25	F	4	6	9	16	14	8	2.947	3.0263	60.53 %
		%	7.0	10.5	15.8	28.1	24.6	14.0			
	Q26	F	3	9	8	18	11	8	2.859		
		%	5.3	15.8	14.0	31.6	19.3	14.0			
	Q27	F	1	4	14	16	14	8	3.087		
		%	1.8	7.0	24.6	28.1	24.6	14.0			
	Q28	F	1	8	11	16	13	8	2.982		
		%	1.8	14.0	19.3	28.1	22.8	14.0			
	Q29	F	1	5	9	19	13	10	3.193		
		%	1.8	8.8	15.8	33.3	22.8	17.5			
	Q30	F	2	7	6	20	14	8	3.070		
		%	3.5	12.3	10.5	35.1	24.6	14.0			
	Q31	F	1	7	6	16	20	7	3.193		
		%	1.8	12.3	10.5	28.1	35.1	12.3			
	Q32	F	3	9	7	18	13	7	2.877		
		%	5.3	15.8	12.3	31.6	22.8	12.3			

V. Interface Quality Question

Table 9 shows interface quality criteria practices that are covered by questions from 33 to 36. The mean values of all practices range from (2.91) to (3.29), so the result is 60.61%.

TABLE 9 INTERFACE QUALITY CRITERIA ANALYSIS

C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
Interface Quality	Q33	F	1	6	8	11	22	9	3.298	3.0307	60.61 %
		%	1.8	10.5	14	19.3	38.6	15.8			
	Q34	F	3	6	11	11	20	6	3.0		
		%	5.3	10.5	19.3	19.3	35.1	10.5			
	Q35	F	2	9	10	12	19	5	2.912		
		%	3.5	15.8	17.5	21.1	33.3	8.8			
	Q36	F	2	6	13	15	16	5	2.912		
		%	3.5	10.5	22.8	26.3	28.1	8.8			

VI. Overall System Question

Table 10 shows overall practice that is covered by question 37. The mean values of this practice (3.00), so the result is 60%.

TABLE 10 OVERALL SYSTEM ANALYSIS

C	Q	M	I Don't Know	Strongly not Agree	Not Agree	Neutral	Agree	Strongly Agree	Q-Mean	C Mean	Result %
Overall	Q37	F	2	10	6	15	16	8	3.0	3.0	60%
		%	3.5	17.5	10.5	26.3	28.1	14.0			

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C. UX Criteria correlation

I. Overview

The purpose of the simple linear correlation analysis is to determine the type and strength of the relationship between two variables, which is denoted by r. The sample as an estimate of the correlation coefficient, and the previous determination of the purpose of the correlation coefficient, we find that it focuses on two points:

Relationship type: Take three types by correlation coefficient signal as follows:

1. If the correlation coefficient is negative (r <0) there is an inverse relationship between the two variables, meaning that the increase of one of the two variables is accompanied by a decrease in the second variable.
2. If the correlation coefficient is positive (r> 0) there is a positive relationship between the two variables, meaning that the increase of one of the variables is accompanied by an increase in the second variable.
3. If the correlation coefficient is zero (r = 0), this indicates the lack of correlation between the two variables.

The strength of the relationship: The strength of the relationship can be judged in terms of the degree of proximity or distance from it (±1) as shown in Table 11, where the correlation coefficient value falls within the range (-1 < r < 1). We can calculate the correlation of the equation:

$$r_p = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)}}$$

TABLE 11 STRENGTH OF THE CORRELATION

Strength of the relationship	r
Completely Positive Correlated	+1
Strong Positive Correlated	+ 0.70 to 0.99
Moderate Positive Correlated	+ 0.50 to 0.69
Weak Positive Correlated	+ 0.01 to 0.49
No Correlation	0
Weak Negative Correlated	- 0.01 to 0.49
Moderate Negative Correlated	- 0.50 to 0.69
Strong Negative Correlated	- 0.70 to 0.99
Completely Negative Correlated	-1

II. Correlation between each criterion

Table 12 shows the correlation between each criteria ease of use (C1), ease of learning (C2), System usefulness (C3), informational quality (C4), interface quality (C5), and overall system (C6). The correlation between informational quality and interface quality is a strong positive correlated value of (0.877).

TABLE 12 CORRELATION BETWEEN EACH CRITERIA

Correlation	C1	C2	C3	C4	C5	C6
C1	1					
C2	.841**	1				
C3	.855**	.857**	1			
C4	.773**	.766**	.818**	1		
C5	.759**	.752**	.821**	.877**	1	
C6	.744**	.715**	.839**	.822**	.845**	1

D. Reliability and Validity Analysis Result

I. Overview

In reliability analysis, inner consistency is used to evaluate the reliability of a summated scale where several items are summed to form a total score. This evaluates reliability in reliability analysis focuses on the internal consistency of the set of questions forming the scale. Table 13 shows how to interpret Cronbach's alpha value.

TABLE 13 CRONBACH'S ALPHA SCALE

Unacceptable		Poor		Questionable		Accepted		Good		Excellent	
α											
0	0.49	0.50	0.59	0.60	0.69	0.70	0.79	0.80	0.89	0.90	1

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II. Alpha Cronbach reliability Analysis

The result of the reliability test for the criteria that was measured using ALPHA Cronbach reliability is (.981) as shown on Table 14.

TABLE 14 RELIABILITY STATISTICS

Cronbach's Alpha	N of Items
.981	30

III. Split-Half Reliability Test

The Split-Half Reliability test assesses the internal consistency of a test, such as questionnaires. There, it measures the extent to which all parts of the test contribute equally to what is being measured. It split the scale questions into two parts based on odd and even numbered questions. Then, the score of half numbers is associated in reliability analysis. High correlations between the two parts show high internal consistency in reliability analysis. Coefficient alpha or Cronbach's alpha is used in reliability analysis. Table 14 shows the result of a split-half scale for 30 questions which is "a." the items from Q8 to Q22 and "b." the items from Q23 to Q37. The split- half coefficient equal to (0.920), which falls in the excellent range.

TABLE 14 SPLIT-HALF RELIABILITY RESULT

Cronbach's Alpha	Part 1	Value	.963
		N of Items	15a
	Part 2	Value	.973
		N of Items	15b
	Total N of Items		30
Correlation Between Forms			.861
Spearman-Brown Coefficient	Equal Length		.925
	Unequal Length		.925
Guttman Split-Half Coefficient			.920

V. CONCLUSION

The aim of this study is to conduct an empirical experiment of the user experience of a workflow system related to Request Management System (RMS) at King Abdulaziz University at Saudi Public Organization. Using five suggested criteria of UX, which are ease of use, ease of learning, system usefulness, informational quality and interface quality. The key element of the study was to use people's opinion in the system development to reveal possible problems and then eliminate them in design. The feedback was taken into account and helped to define preferred criteria to how content, efficiency of use and visual appearance of the system can be improved. According to the results all criteria were judged to be approximately equally by the participants, although ease of learning appeared to be slightly higher, and therefore the least influential. As a result, the statistical analysis highlighted the performance of the model is high and the model can be applied in other organizations to measure the quality and use of workflow management systems from the user's perspective. It can use the suggested criteria to assess and improve the UX of other organization's workflow systems to fulfill the user's needs and provide positive experiences that are most conducive to business success. In future, the proposed framework can be enhanced based on the findings in this study, whereas the model will be validated using multiple case studies to compare and analyse the user experience in different organizations.

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