

Development and usability evaluation of a web-based health information technology dashboard of quality and economic indicators

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ABSTRACT

Introduction: Strategic dashboards, including hospital economic monitoring systems, play a major role in analyzing data and making decisions. As the health system is a multidimensional ecosystem, decision-makers and healthcare officials must gather and integrate information from numerous health information systems to monitor and direct healthcare centers. This study aims to develop and usability evaluation of a health information technology dashboard in Iran that utilizes qualitative and economic indicators.

Material and Methods: This study was conducted in four phases. It included extracting the requirements of the system through the focus group technique. Based on these results, a comprehensive economic dashboard was developed. Then, the system's usability is evaluated from the perspectives of experts and end-users by two scales of Nielsen and USE, respectively.

Results: The dashboard was developed on the web and different access levels were defined for users according to their roles. This dashboard provides the ability to integrate information from different systems at the national level for decision-makers. The results of usability evaluation from users' point of view showed that it has a good level of usability. Furthermore, evaluation results revealed that aesthetic aspects and simple design and clarity of system status (0%), privacy (1.49%), "visibility and clarity of the system" and "adaptation between the system and the real world" (2.98%), have the fewest design errors. With 14 problems (20.89%), "recognition rather than remembering" and "compliance with uniformity and standards" have the highest frequency of problems.

Conclusion: The development of an extensive integrated economic health dashboard, based on usability principles that are suitable for its stakeholders regardless of their specialty and granted access level, is welcomed by the health economist, hospital managers, and the ones who have an active role in monitoring and coordinating hospitals or even in greater scales such as national wide decision makers.

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INTRODUCTION

Strategic dashboards, also known as management dashboards, allow managers to analyze a large amount of data and make decisions based on reliable information at the proper moment. They present critical business information visually and graphically

[1].

Nowadays, it is believed that with the optimal management of hospitals, it is possible to achieve integration between organizational intelligence (specialized people), business intelligence (types of available data), and competitive intelligence

(constant communication with internal and external customers). Access to quick, efficient, and strategic information is necessary to make intelligent and important decisions, which is a basis for building such intelligence. Intelligence dashboards can be very useful and efficient for transmitting this information and management priorities levels [2].

Effective management and functional improvement of strategic dashboards require identifying and optimizing multiple variables. Therefore, more dynamic systems for transmitting, classifying, and analyzing information in real-time static reporting systems cannot satisfy the decision-making needs of healthcare managers [3].

When supported and organized by the appropriate Information Technology (IT) infrastructure, performance dashboards can assist healthcare management in focusing on more crucial tasks, identifying problem areas, interpreting the underlying causes of poor performance, and predicting the future [4, 5].

The development of dynamic systems that assist health managers in continuously assessing the performance of the organization is possible by performance dashboards that are prepared using performance measurement and the principles of executive information systems [6, 7].

Selecting a suitable and effective dashboard from numerous alternatives is often very effective and practical in the use of users, and this tool has been considered and used in the health sector [8, 9]. Dashboards should consistently meet the goals and expectations of users [10]; so, it is necessary for dashboards to constantly evolve and improve [11, 12].

The integration of health information systems and providing integration across heterogeneous systems is critical to increasing their usability. Otherwise, non-integrated systems might derive dissatisfaction among users or even be abandoned [13]. Monitoring dashboards and health information systems regularly will help find problems, prevent mistakes, and enable accurate problem-solving [14].

Health economics is one area in which management dashboards have matured. Health economics, based on scientific methods of resource allocation, productivity improvement, establishing equality, information management, and economic evaluations, can greatly assist treatment and health sector managers and policymakers in achieving the marvelous goals of providing health and treatment to people [15].

Shiraz University of Medical Sciences decided to develop an economic monitoring system in 2018 because it is affiliated with more than 45 health facilities and hospitals. Furthermore, at Shiraz

University, more than 190 health information systems that generate massive amounts of data about various aspects of the health system are working to move in this direction and achieve these goals, first on a provincial level and then as a comprehensive national system. To make better use of data, healthcare officials and decision-makers developed an integrated health system made up of various sub-systems that track and analyze health facilities and hospitals in terms of functions, financing, and human resources.

In the following of this essay, in the method section, the various stages involved in evaluating and developing Payesh were explained individually about the needs assessment process. Besides, the findings section presented an assessment of the usability results, which were evaluated from both the expert and end-user perspectives

MATERIAL AND METHODS

This paper describes the development and evaluation of Payesh, a hospital economic monitoring dashboard. The research methodology is a development-applied study, with three stages of requirement analysis, development, deployment, and usability evaluation:

The first phase: Identifying and confirming requirements

Focus groups are an effective way to collect information about a group's attitudes, perceptions, and needs, as well as the contextual factors that influence those views. The goal of our study's focus group was to identify the preferences, needs, and values of care providers who would eventually use the managerial dashboard. A focus group of care providers was formed to determine the dashboard requirements and needed indicators. Participants in the focus group included more than 100 managers, physicians, and hospital quality specialists. Meetings with the cooperation of the deputies of health, treatment, and resource management and planning of Shiraz university of medical science, as well as officials of the other departments (human resources, IT, and medical statistics and documents department), as well as groups of hospital managers and support staff from various departments (quality management, information technology, and financial department), took place over nearly two years.

Over 50 interviews were conducted with groups of invited participants from various departments. Each interview lasted about 90 min. Each focus group interview was moderated by one experienced senior academic staff member in the research team.

The second phase: Development and implementation

The developed dashboard was named Payesh. (Payesh means monitoring in the Farsi language and the purpose of selecting this name was to monitor the performance as well as inputs and outputs of healthcare centers). Payesh dashboard was created based on the approved requirements of participants. The component-based software development approach was used to create this dashboard. This approach is one of the software development methods that provide more capabilities in the areas of reusability, flexibility, and the ability to maintain and support software [16]. Payesh has a web-based user interface.

After logging in to the dashboard, dashboard users can access the authorized sections based on their access levels.

Payesh dashboard was launched for the first time in Iran and has been used in Shiraz University of Medical Sciences (SUMS) affiliated hospitals in Iran since 2016 until now at the address <https://payesh.sums.ac.ir/Account/Login>.

The third phase: Usability evaluation

Dashboard implementation was followed by usability evaluation. The International Organization for Standardization (ISO) defines usability evaluation as determining how well a user can use a product in a given context to accomplish a goal regarding efficacy, effectiveness, and satisfaction. Usability evaluation aims to identify the dashboard's benefits as well as drawbacks.

This study used two evaluation methods based on end-users and experts. Jakob Nielsen's 10 usability heuristics for user-interface design was used to evaluate the opinions of experts and the USE questionnaire [17] was used to evaluate the views of end users. The Nielsen assessment checklist published by Xerox includes thirteen general principles and a total of 296 questions. The number of evaluators is suggested to be 3 to 5 according to Nielsen's recommendations. Three experts in health information management, medical informatics, and computer engineering independently evaluated Payesh dashboard. The data collected in independent evaluations were matched together, and from the total problems identified by the evaluators, repeated cases were removed and similar cases were determined. Moreover, the compliance of each of the problems with the heuristics considered by each of the evaluators was examined. Then, the problems were entered into two separate lists according to the type of heuristic and the evaluated part of the dashboard. For each of the problems found, the number of evaluators who found that problem was entered. Any disagreements about the problems found and their allocation to each of the heuristics were discussed and resolved by SPSS in joint meetings. Then the data were analyzed using SPSS

software. Considering that Payesh dashboard users include different groups of people with educational levels (bachelor's to doctorate) and job positions (from Information Technology experts, university professors to hospital managers), different groups of users were invited and 20 people from the end users of the dashboard with a minimum work experience of 2 and a maximum of 26 years of work experience and an average of 19.2 years of work experience and an average age of 43.2 years, all of whom were fully familiar with International Certificate of Digital Literacy certificate (ICDL) skills, were selected in the evaluation from the users' point of view. These users use the dashboard for an average of 6.2 hours during the day. Their opinions were collected through the USE questionnaire, which includes 4 dimensions of information characteristics: usefulness, easy learning, easy use, and satisfaction in 30 questions. A 7-point Likert scale was used to answer the questions.

RESULTS

The first phase: Identifying and confirming requirements

Regardless of differences in the development process and needs of various focus groups, key performance indicators on the draft list are 107 indicators.

After the participation of the focus groups, we tried to create the final list of indicators regarding the universality and priority of indicators sorted in the draft list.

We divide prioritized indicators into three categories regarding financial, functional, and human resources (the full list of indicators is presented in appendices).

We defined indicators at various levels for the dashboard to monitor inputs and outputs of hospitals. The first level is general and assesses the hospital's overall performance. The second level has much more detailed indicators than the first layer. Fig 1 represents the distribution of indicators.

Given the broad scope of the monitoring dashboard and the variety of services available, one of the most important aspects to consider in this dashboard is the administrative and user access levels of the dashboard. The general access levels of the dashboard include management levels including the senior manager of the dashboard (Health Economics Council), senior managers of the university (university president, vice presidents of the university, users of the university headquarters area, managers of subordinate units, users of subordinate units).

In the following, we review some considerable applications' of Payesh dashboard including:

- Presenting statistical reports

- Declaring indicators and calculating their related formulas
- Monitoring indicators
- Defining informative databases and sub-systems
- Declaring administrative and user access levels
- Extracting brief and extensive reports of the performance of healthcare centers
- Providing brief and extensive reports of sub-systems integrated with Payesh
- Providing and using applicable scenarios designed to solve challenges of healthcare centers based on artificial intelligence

Because of the monitoring dashboard's diverse departments and user roles, statistical reports have been enabled in all departments.

It is important to note that the application of various indicators in the health dashboard is applied for dashboard analysis and decision-making. As a result, decision-making techniques including the Simple Additive Weighting method (SAW) and The Technique for Order of Preference by Similarity to the Ideal Solution (TOPSIS) are used in Payesh.

SAW is chosen because it is a scoring-based prioritization method. This method is effective when making decisions based on a combination of quantitative and qualitative criteria [18].

TOPSIS is a decision-making method based on the concept of the ideal solution. In this manner, the option with the greatest distance from the negative solution and the smallest distance from the positive ideal is prioritized [19].

In Fig 1, the distribution of different types of 107 indicators which are nominated as the most important indicators for monitoring hospitals is presented three main categories including 22% human resource, 40% financial, and 38% functional indicators.

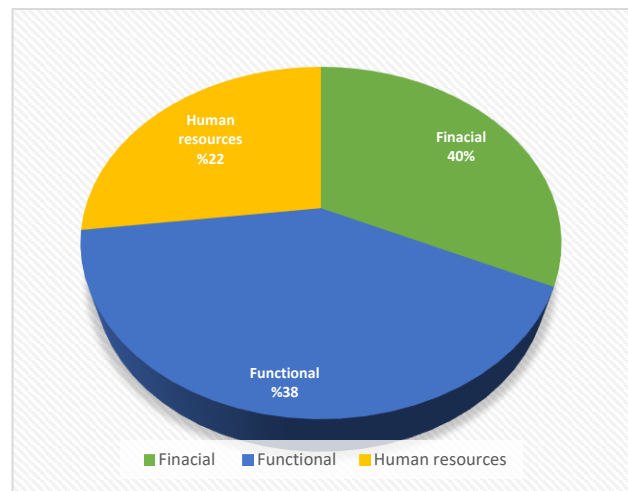


Fig 1: Distribution of indicators of Payesh system

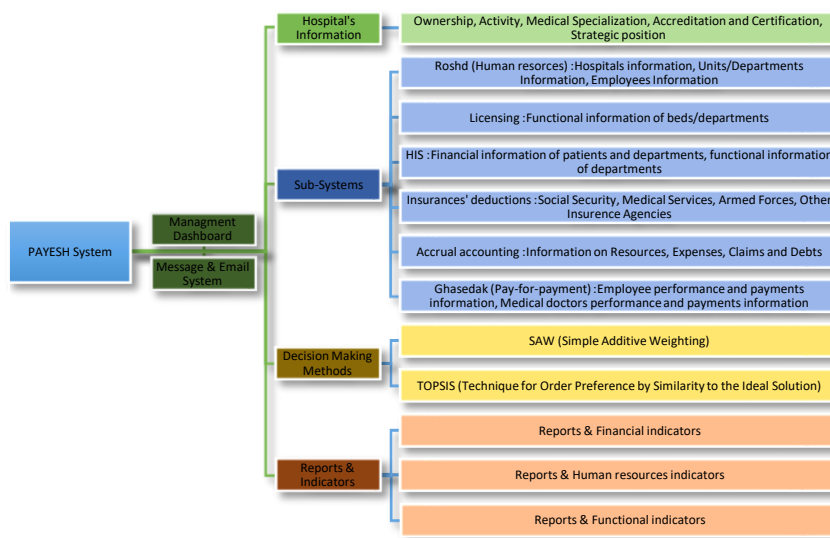


Fig 2: An overview of the Payesh system

The second phase: Development and implementation

In Fig 2, the overview, numerous applications, and interrogated sub-systems of Payesh dashboard are described as follows:

- Hospitals’ information: This part contains basic information and identification for each hospital, such as its geographic location, type of activity, ownership, and so on.
- Sub-systems: This section includes sub-systems, all/part of their information is entered into the monitoring dashboard. These systems include:
 - Roshd system: The system in which the human resources and employment information of the employees of each hospital is recorded.
 - HIS system: The system in which demographic, clinical, diagnostic, financial, and insurance information of patients is recorded.
 - Accrual system: The system in which financial and accounting information related to revenues and expenses of each hospital is recorded.
 - Insurance deduction system: The system in which information about the status of payments of each of the main insurances is recorded. Each insurance organization has its system in this field.
 - System for licensing of Hospitals: The system that records the basic information of each hospital, including activity licenses, and technical performance such as bed occupancy rate, bed circulation, etc.
 - Ghasedak system: a system in which information related to the payment on performance and overtime payments of hospitals' staff is recorded.
- Decision-making systems: techniques/methods that, based on the information available in the monitoring system, provide an extensive evaluation and ranking of hospitals based on the indicators and information selected by the various users of the dashboard. The SAW technique enables decision-making in a one-dimensional space (close to the ideal point) and the TOPSIS technique enables decision-making in a two-dimensional space (close to the ideal point and at the same time away from the anti-ideal point). This section is also used for providing scenarios in the monitoring dashboard.
- Reports and indicators: In order to facilitate the use of information entered from other sub-systems, some reports and indicators are included in the monitoring dashboard by default. These default reports and indicators

are classified into three main categories including functional, financial, and human resources.

- Managerial dashboards: since different users at different management levels use Payesh dashboard, a dashboard that can be changed/configured with different information and reports have been defined for each level of users.

The third phase: Usability evaluation

Usability evaluation based on the end-user experience

The research instrument used USE Questionnaire as seen in Table 1. This questionnaire used in usability measurement is a series of questionnaires that can process data related to effectiveness, efficiency, and satisfaction in the use of a web-based information dashboard. Underlying the USE of questionnaires is a questionnaire that can provide convenience for respondents to understand and answer the questions properly. In addition, the questionnaire made the respondents more comfortable and freer in answering questions. The usability measurement adopts USE Questionnaire because according to the ISO 9241-11:1998 documentation, the measurement of user satisfaction as part of the Usability parameter includes three measures parameter that is efficiency, effectiveness, and satisfaction.

Table 1: Usefulness questions with labels (UU=Usefulness)

Label	Usefulness questions	Score
UU1	It helps me be more effective	5.94
UU2	It helps me be more productive	5.8
UU3	It is useful	5.87
UU4	It gives me more control over the activities in my life	5.73
UU5	It makes the things I want to accomplish easier to get done	5.47
UU6	It saves me time when I use it	5.4
UU7	It meets my needs	5.2
UU8	It does everything I would expect it to do	5

The mean score of 5.55 suggests that users considered the dashboard with a good level of utility. The lowest score in this set of questions is for UU8 questions.

The set of questions about Ease of Use aims to measure the experience of the user with the dashboard. Payesh scored well in this aspect too, with a mean of 5.28 out of 7. Table 2 shows each question and its average score. The question with the highest score was whether the user could simply learn how to use it without instructions, with a score of 5.8. In the set of questions related to UL, Payesh also scored well, with an average of 5.67 out of 7.

Table 2: Ease of use questions with labels (UE=Ease of Use)

Label	Ease of use questions	Score
UE1	It is easy to use	5.6
UE2	It is simple to use	5.8
UE3	It is user friendly	5.67
UE4	It requires the fewest steps possible to accomplish what I want to do with it	5.33
UE5	It is flexible	4.93
UE6	I can use it without written instructions	4.8
UE7	I don't notice any inconsistencies as I use it	5
UE8	Both occasional and regular users would like it	5
UE9	I can recover from mistakes quickly and easily	5.33
UE10	can use it successfully every time	5.33

Table 3: Ease of Learning questions with labels (UL=Ease of Learning)

Label	Ease of Learning	Score
UL1	I learned to use it quickly	5.47
UL2	I easily remember how to use it	5.8
UL3	It is easy to learn to use it.	5.6
UL4	I quickly became skillful with it.	5.8

Table 3 shows each question's score. The questions with the highest score were UL4 and UL2, with a score of 5.8. Considered along with the answers showing high learnability discussed above this shows that Payesh is both easy to learn without instructions and easy to use without much effort once it's learned.

Table 4: Satisfaction questions with labels (US=Satisfaction)

Label	Satisfaction	Score
US1	I am satisfied with it	5.6
US2	I would recommend it to a friend	5.47
US3	It is fun to use	5.6
US4	It works the way I want it to work	5.4
US5	It is wonderful	5.4
US6	I feel I need to have it	5.4
US7	It is pleasant to use	5.53

Table 4 shows questions related to user satisfaction, Payesh also scored well, with an average of 5.49 out of 7.

Usability evaluation based on experts' experience

145 problems are discovered in various parts of Payesh dashboard during its evaluation using heuristic evaluation components. There are 67 known individual problems, 46 of which are repeated similarly in more than one part of the dashboard. Only 29.85% (N=20) of the individual identification problems are recognized by one evaluator, while 37.31% (N=25) are recognized by all three

evaluators.

The evaluation results revealed that aesthetic aspects and simple design and clarity of dashboard status (0%), privacy (1.49%), "visibility and clarity of the dashboard" and "adaptation between the dashboard and the real world" (2.98%), have the fewest design errors. With 14 problems (20.89%), "recognition rather than remembering" and "compliance with uniformity and standards" have the highest frequency of problems.

DISCUSSION

We conducted this study to develop and evaluate the usability of Payesh dashboard. Focus groups are used to gather dashboard requirements. Then, the dashboard's usability is evaluated from the perspectives of experts and end users. Senior management support and participation in the development of Payesh is regarded as an important success factor, and the dashboard's implementation will enable the hospital to significantly improve the performance of management indicators in management dimensions, hospital accreditation, and healthcare quality. Following its implementation, Payesh dashboard is recognized as an innovative idea at Shiraz University of Medical Sciences.

In this essay, we made an effort to express Iran's experiences regarding the development and evaluation of a comprehensive managerial dashboard individually for each healthcare faculty, provincially, and countrywide. Health dashboards provide crucial data and analysis to managers, allowing them to make intelligent choices. Managerial, functional, and economic health dashboards focus on organizational goals, departmental performance, and financial performance, respectively. Health systems may enhance efficiency, optimize resource allocation, reduce expenses, and ultimately improve patient care by adopting these dashboards. Moreover, it is critical to assess the performance of these systems concerning clinical relevance, efficiency, and usability [20].

These dashboards are widely recognized for providing better quality and safety performance, instant access to healthcare services, and reducing costs, covering varied geographical regions.

Information sharing between systems can support continuous medical care, but inadequate data flow due to a lack of system integration can hinder this process [21]. Integrated health information systems aim to provide continuous workflow, integrated information flow, and facilitate healthcare decision-making [22]. These dashboards are widely recognized for providing better quality and safety performance, instant access to healthcare services, and reducing costs, covering varied geographical

regions [23].

Information systems and dashboards must be usable to ensure effective healthcare and information [24]. The assessment of usability through user or expert evaluation is essential to ensure the proper design of health systems. Usability is measured by how easily and effectively users can interact with a system and their satisfaction with it [25].

Since managerial dashboards play a major role in the health sector, especially in unexpected crises such as COVID-19, the development of such a dashboard is crucial for health systems. Thereby, we attempt to arrange a prototype management dashboard consisting of the most important KPIs for monitoring hospital performance.

In recent years, KPIs have been discovered to be reflective of global healthcare systems [26]. Additionally, information is crucial for reducing the physical and psychological toll on people during a pandemic crisis, so it's vital to use flexible KPI categories and adapt them to healthcare facilities [27, 28].

The particularities of a pandemic crisis reduce the significant difference between healthcare systems around the world since a crisis is a negative phenomenon at the global level, and its consequences are more or less evaluated by KPIs [29].

Payesh consists of three major groups of KPIs, which include financial, functional, and human resource indicators that represent the most important aspects of hospital performance separately, provincially, and nationally.

As healthcare systems are consistently dealing with financial challenges, we assembled a set of financial indicators in the system for monitoring hospital finances. Financial indicators help managers to monitor revenue and expenses, track financial trends, and identify opportunities for cost reduction and revenue generation. Financial indicators also provide key information for budgeting and resource allocation decisions, enabling managers to make informed decisions about investments in new technologies, facilities, and services. By including financial indicators in managerial dashboards, healthcare organizations can improve financial sustainability, optimize resource allocation, and ultimately improve patient care.

According to Behzadifar et al., COVID-19 caused public hospitals to lose an average of \$172,636 per month in revenue. For roughly 13 months, the trend of declining hospital revenue persists [30].

Besides that, since the COVID-19 outbreak has an impact on the utilization and costs of healthcare services, we gather functional key indicators which are related to the performance of the hospitals.

Koumpias et al. claimed that Over a six-month post-diagnostic period, the diagnosis of COVID-19 was related to higher healthcare utilization and expenses. These findings imply a continuous financial and medical impact on the US healthcare system from COVID-19 patients [31].

The most critical indicators regarding human resources for inspecting the distribution and performance of human resources in hospitals are gathered since providing health services by specialized and trained healthcare workers is one of the primary duties of the health system.

As shown by Van Hout et al., the COVID-19 pandemic in Europe had a significant impact on those who provided direct COVID-19 healthcare. Among 2289 healthcare workers whose mean age was 42 years, 66% were female, 47% were medical doctors, and 39% were nurses. Furthermore, they reported high levels of concern about the risk of COVID-19 infection to themselves (71%) and their families (82%) as a result of their job. Additionally, 40% of senior healthcare workers were less likely than juniors to feel this way [32].

In the end, this management information dashboard at the countrywide and provincial levels in Iran is a pre-structured form of a decision support system that will be developed with the support of the ministry of health and medical education in the coming years.

The most important capability of Payesh is its ability to adhere to the principle of development integrity. Payesh dashboard can combine data from several national systems in Iran. The integration enables the provision of a unified and integrated view of the organization's financial, clinical, and operational performance.

One of the fundamental applications of a dashboard is its ability to integrate various data, data structures, and resources into a unified interface [33].

The availability of health, clinical, and management information systems and dashboards is vital in healthcare. However, it's crucial to minimize errors resulting from their use [34]. These systems are widely employed, and their usability is an essential feature that simplifies their usage [14].

The problems caused by the dashboard's lack of usability, such as the display of false and ambiguous messages and feedback lacking important information, confuse users and reduce the dashboard's and service delivery's efficiency and quality [35]. As a result, by performing the evaluation, it is possible to identify the problems in the dashboards and take action and plan to solve them to increase the level of user satisfaction and the quality of the dashboard and take steps toward its improvement.

Dashboards should consistently meet the goals and

expectations of users [36]. Dashboards must evolve and improve regularly in this regard. As a result, evaluating the performance of these systems based on usability is critical [20].

Dashboard usability is one of the capabilities required by information systems and dashboards to provide better quality health care and information. Usability refers to the ease of use of a dashboard as well as the level of effectiveness, efficiency, and satisfaction of its users when working with the dashboard.

The usability evaluation results show that Payesh has a high level of applicability from the perspective of end users.

According to experts' opinion, this dashboard does not have a help section. Although it is preferable to be able to use the dashboard without providing the document, providing the documentation may be necessary. Such information should be easy to search and focused on the user's work; it should also include a list of steps to complete the work and not be too large. As a result, it is recommended to add the help section to improve user interaction with Payesh dashboard.

There was no design problem from the standpoint of "Aesthetic and Minimalist Design" according to experts' opinion. This evaluation alignment believes that dialogue should not include irrelevant or infrequently required information. Each additional information unit in the dialogue competes for visibility with relevant and appropriate information units and reduces their relative visibility.

The evaluation aspects of "Visibility of dashboard Status", "Pleasurable and Respectful Interaction with the User" and "Match Between dashboard and the Real World" have the least number of usability flaws. These indicate that Payesh dashboard provides users with the necessary information about what is going on in a reasonable amount of time through appropriate feedback and creates effective interaction with the user. Furthermore, the dashboard speaks in the user's language, using words, phrases, and concepts familiar to the user rather than dashboard words.

Another problem that had the highest frequency was "Recognition Rather Than Recall", according to the results. The user's memory load in information dashboards can be reduced by exposing options, actions, and items. How information and its content are displayed should be such that users can understand their purpose and require less mental and physical effort to perform their actions.

In summary, the identified problems that affect the usability of the developed dashboard should be resolved in the next version of this dashboard.

Strengths and limitations

This study like other ones has its limitations. Lack of experience in developing such extensive managerial dashboards and required infrastructures faced developing countries with various challenges. Moreover, through this study, we tried to gather as many indicators that we noticed could be important in administrating healthcare faculties, yet there are some indicators ignored or neglected inevitably during the development and usability evaluation of Payesh.

Payesh developed as the first economic managerial dashboard, on a countrywide scale, that helps to monitor healthcare faculties in terms of financial, functional, and human resources at various levels, including individually, provincially, and nationally. Payesh's development was the first step to expanding an integrated dashboard connected to numerous chief health systems that gather and record on the web. Additionally, this dashboard is developed to turn into a Decision support system (DSS) and an artificial intelligence system due to its ability to analyze large amounts of data quickly and accurately, identify patterns and trends, and provide insights that can help healthcare providers make more informed and effective decisions. AI-powered decision support systems can also help reduce medical errors, improve patient outcomes, and optimize healthcare delivery.

CONCLUSION

Managerial dashboards play a vital role in health systems by providing real-time, accurate, and relevant information that helps hospital administrators and healthcare providers make informed decisions. Additionally, managerial dashboards facilitate effective communication and collaboration between various departments and stakeholders, allowing for efficient resource allocation, staff management, and overall hospital operations. By utilizing managerial dashboards, healthcare faculties can improve patient care quality, enhance operational efficiency, and achieve their strategic goals.

Payesh, an extensive managerial dashboard that includes three main categories of indicators including financial, functional, and human resource, developed to expand health information systems and the use of Decision support systems (DSS) and business intelligence for improved decision-making, providing timely and accurate information for healthcare providers to make informed and effective decisions.

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conducting this study.

AUTHOR'S CONTRIBUTION

All the authors contributed to different sections of this study, including conception, design, data collection, data analysis, drafting, and approval of the final draft.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

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FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

ETHICS APPROVAL

Ethics approval (IR.SUMS.NUMIMG.REC.1400.013) was obtained from the ethics committee of SUMS. The participation of end users and experts was voluntary and they could withdraw from the study at any time. Informed consent was obtained from them for participation.

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