



Evaluating User Experience and Enjoyment with E-Government Portal in Libyan Higher Education

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Abstract:

E-government portals have become vital tools for modernizing public services, particularly in higher education. This pioneer study evaluates the usability and user enjoyment of the Libyan Ministry of Higher Education's e-government portal, focusing on key dimensions such as effectiveness, efficiency, and user satisfaction. Despite its role in streamlining administrative processes, users frequently encounter challenges, including unclear instructions, restrictive data update processes, and insufficient feedback mechanisms. Findings indicate that while the portal performs well in efficiency and effectiveness, user enjoyment remains a critical area for improvement. Strong correlations between usability factors suggest that addressing identified issues—such as enhancing interface design, improving task guidance, and implementing real-time feedback mechanisms—can significantly enhance user experience. This research provides actionable recommendations to optimize e-government portals, ultimately supporting the digital transformation of Libya's higher education sector.

Keywords: E-government, Usability, Enjoyment, Efficiency, Effectiveness, Portal.

تقييم تجربة المستخدم لبوابة وزارة التعليم العالي الليبية الإلكترونية

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الملخص

أصبحت بوابات الحكومة الإلكترونية أدوات حيوية لتحديث الخدمات العامة، لا سيما في التعليم العالي. تقيم هذه الدراسة الرائدة قابلية الاستخدام واستمتاع المستخدمين ببوابة الحكومة الإلكترونية التابعة لوزارة التعليم العالي الليبية، مع التركيز على الأبعاد الرئيسية مثل الفعالية والكفاءة ورضا المستخدمين. على الرغم من دوره في تبسيط العمليات الإدارية، يواجه المستخدمون في كثير من الأحيان تحديات، بما في ذلك التعليمات غير الواضحة، وعمليات تحديث البيانات التقييدية، وآليات التغذية الراجعة غير الكافية. تشير النتائج إلى أنه على الرغم من أن البوابة تعمل بشكل جيد من حيث الكفاءة والفعالية، إلا أن متعة المستخدمين تظل مجالاً حاسماً للتحسين. تشير الارتباطات القوية بين عوامل قابلية الاستخدام إلى أن معالجة المشكلات المحددة -مثل تحسين تصميم الواجهة وتحسين توجيه المهام وتنفيذ آليات التغذية الراجعة في الوقت الفعلي- يمكن أن تعزز تجربة المستخدم بشكل كبير. يقدم هذا البحث توصيات قابلة للتنفيذ لتحسين بوابات الحكومة الإلكترونية، مما يدعم في نهاية المطاف التحول الرقمي لقطاع التعليم العالي في ليبيا.

الكلمات المفتاحية: الحكومة الإلكترونية، سهولة الاستخدام، المتعة، الكفاءة، الفعالية، البوابة الإلكترونية.

Introduction

E-government portals have become essential in modernizing the delivery of public services, particularly in higher education. These systems aim to streamline administrative processes, providing users with convenient, accessible, and efficient services [1] [2]. In Libya, the Ministry of Higher Education's e-government portal, (<https://mohe.edu.ly>), was introduced to enhance communication, reduce bureaucratic delays, and improve service delivery. The portal is managed by the Universities Affairs Department, which manages cooperation among Libyan universities and facilitates the administration of faculty members, teaching assistants, and university staff

in compliance with applicable legislation. Faculty members, teaching assistants and universities' employees are invited to register at this portal, validate their information, and complete some administrative procedures. However, During the registration process and subsequent data updates, users encountered numerous challenges, including a lack of clarity regarding the requirements and constraints imposed on updating their information. This ambiguity created significant confusion and often led to errors or incomplete submissions. Furthermore, the restrictive nature of the data update process limited users' ability to correct inaccuracies or make necessary modifications. These shortcomings not only hinder user enjoyment but also discourage broader adoption of the e-government portal, undermining the initiative's goals. Addressing these challenges is crucial for ensuring the success of e-government systems in higher education. This research is a pioneer study that evaluates the user experience with Libya's Ministry of Higher Education portal, identifies key usability issues, and proposes design guidelines to enhance its functionality and user enjoyment. These recommendations aim to serve as general design principles for e-government portals to better meet user needs and expectations.

Research problem:

Despite the growing adoption of e-government portals to modernize public services in higher education, user enjoyment and engagement remain critical challenges. In Libya, the Ministry of Higher Education's e-government portal aims to streamline administrative tasks and improve service delivery. However, users frequently encounter significant usability issues, including unclear instructions, restrictive processes for data updates, and unintuitive system design. These challenges lead to errors, incomplete submissions, and decreased user enjoyment, ultimately hindering the adoption and effectiveness of the portal. The lack of user-centered design principles exacerbates these issues, leaving the system unable to fully achieve its intended goals of efficiency and accessibility. This research seeks to identify specific problems by evaluating the usability and user experience of the portal and developing meaningful design guidelines to enhance its functionality and user enjoyment.

Research objectives:

1. To assess the usability and enjoyment levels of e-government portal in Libyan higher education.
2. To identify common usability issues affecting the portals.
3. To provide recommendations for improving the design and functionality of Libyan e- government portals.

This research will contribute to the body of knowledge on e-government and UX by addressing a specific context that has been underexplored. The findings will be valuable for stockholder, designers, and developers working on Libyan e-government portals, enabling them to create more effective and user- friendly systems. Additionally, the study will support the broader goal of enhancing digital transformation in Libya's higher education sector.

Research questions

1. What are the current levels of user enjoyment with e-government portals in Libyan higher education?
2. How enjoyable do users find the overall experience of using the Libyan Higher Education e-government portal?
3. To what extent does the portal's design and interactivity enhance user engagement and enjoyment?
4. How effectively does the portal enable users to complete key tasks, such as accessing academic records, submitting applications, or retrieving information?
5. Do users perceive the portal as a reliable and accurate tool for their needs in higher education?
6. How well does the portal align with user expectations in terms of functionality and service delivery?
7. How efficiently can users complete common tasks on the portal, such as logging in, navigating pages, or submitting forms?
8. To what extent do technical issues (e.g., slow loading times or system crashes) impact users' perceptions of efficiency?
9. How satisfied are users with the portal's responsiveness and performance under varying levels of usage?

Literature reviews:

E-government websites have become essential tools for modernizing public administration, enhancing service delivery, and fostering citizen engagement [1] [3]. Their effectiveness hinges on adherence to established usability standards and design principles, particularly those outlined in ISO 9241 [4]. E-government platforms aim to provide citizens with convenient, accessible, and efficient services, reducing bureaucratic delays and improving transparency.

In the context of higher education, e-government portals like the one managed by Libya's Ministry of Higher Education (<https://mohe.edu.ly>) are designed to streamline administrative processes, facilitate communication, and ensure compliance with legislative requirements. The digital provision of services, programs, and information by governments enhances convenience and operational efficiency. According to a study by Almarabeh and AbuAli (2010), e-government systems can significantly reduce the time and effort required for administrative

tasks, leading to increased user satisfaction and engagement [5].

However, the success of these systems depends on their usability and ability to meet user needs. Poorly designed e-government portals can lead to frustration, errors, and incomplete submissions, ultimately undermining their intended benefits. The ISO 9241 standard plays a crucial role in enhancing the usability of e-government portals, which are essential for facilitating citizen engagement and service delivery. By focusing on usability aspects such as effectiveness, efficiency, satisfaction, and ease of use, ISO 9241 provides a framework for evaluating and improving the quality of these digital platforms.

The integration of ISO 9241 with other quality models and frameworks can significantly enhance the user experience and operational efficiency of e-government services [4] [6] [7] [8]. To improve the user experience of e-government services, governments should emphasize bridging the technology-life quality gap, addressing peoples' demands, and concentrating on social elements. [3] [7]. In the context of higher education, the usability of academic web portals plays a pivotal role in fostering social-academic learning. A study by Festus et al. (2022) evaluated the usability of such portals, highlighting well-designed interfaces in an attempt to contribute to enhanced collaborative learning and increased user engagement [9].

Recent studies have underscored the importance of user experience (UX) in the design and deployment of e-government services. A systematic literature review by Aldrees and Gračanin (2023) emphasized that focusing on citizens' characteristics and social aspects significantly affects their experience with technology, thereby influencing the overall effectiveness of e-government services. [3]

Methodology

This study employs a mixed-methods approach to gain a comprehensive understanding of user experience and enjoyment with the Libyan Ministry of Higher Education's e-government portal. By integrating both quantitative and qualitative data collection methods, the research aims to provide a well-rounded analysis of usability issues and user perceptions.

Data collection

To gather empirical evidence, an online survey was administered to faculty members, teaching assistants, and administrative staff who actively use the e-government portal. The survey aims to collect structured feedback on usability, performance, and enjoyment to improve the Ministry of Higher Education's web portal. The survey included a combination of Likert-scale questions, open-ended questions, and multiple-choice questions to measure enjoyment levels, identify usability challenges, and capture user feedback on system functionality and

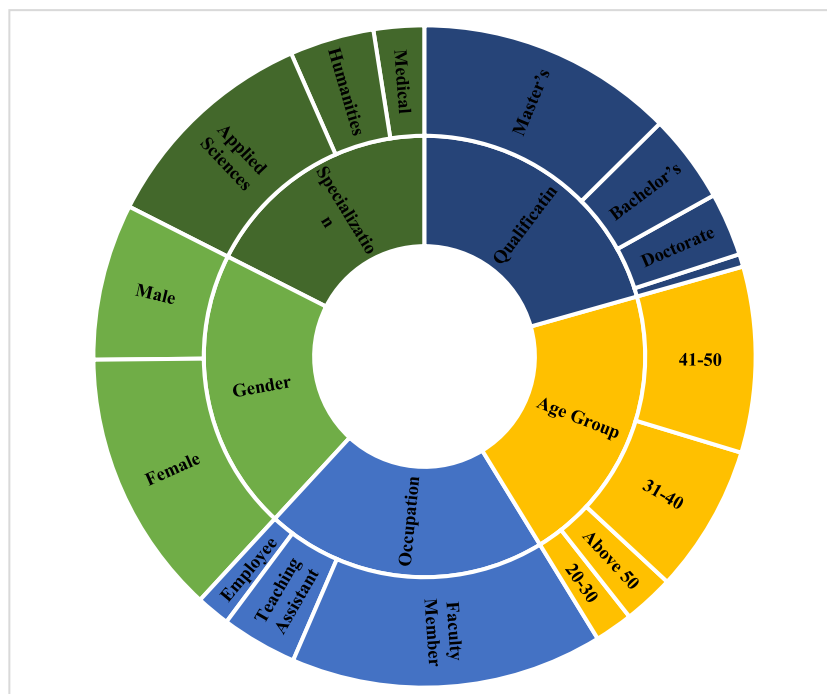


Figure 1 Demographic details of sample

efficiency. A random sample has been collected of correspondents consisting of 100 participants, categorized based on gender, occupation, age group, and specialization as shown in Figure 1. It provides an overview of the sample composition, illustrating the diversity of participants whose experiences with the e-government portal was analyzed.

Data analysis

The data collected was analyzed using Statistical Package for the Social Sciences (SPSS) software. Descriptive and inferential statistical techniques were applied to assess trends in user enjoyment, identify key usability bottlenecks, and explore correlations between system design factors and user experience. Open-ended responses were examined through thematic analysis to extract qualitative insights into user pain-points and areas for improvement.

By combining quantitative metrics with qualitative insights, this study provides a holistic assessment of the portal's usability, offering actionable recommendations for enhancing its design and functionality. Figure 2 categorizes correspondents based on how they complete their administrative tasks on the portal, either independently or with assistance.

The data indicates that a large majority (87%) prefer to execute tasks independently, while 13% rely on assistance. This highlights potential usability issues that may be prompting a minority of users to seek help

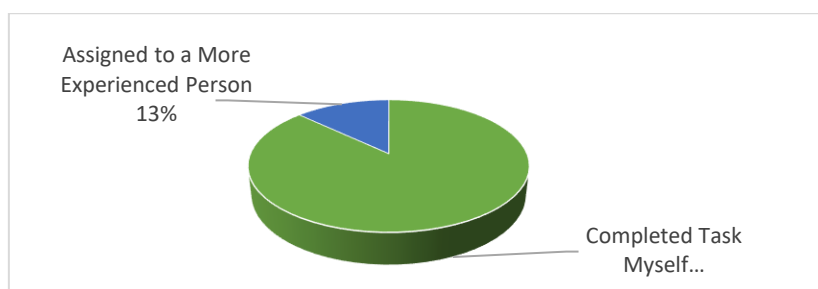


Figure 2 Task Execution Method

Figure 3 shows the types of administrative tasks performed by users on the portal resulted in updating information (67%), registration (13%), and resumption of duty (20%).

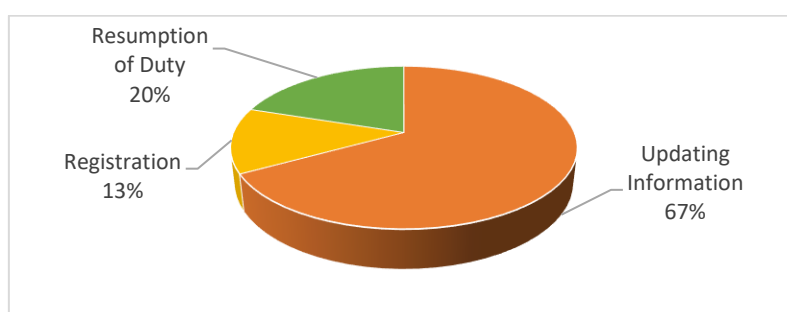


Figure 3 Administrative tasks performed

Notably, 67% of users utilize the portal for updating information, which emphasizes the importance of ensuring that this functionality is user-friendly and efficient.

Table 1 provides T-test results for enjoyment, effectiveness, and efficiency. It evaluates whether these dimensions meet a hypothetical mean value of 24. These results could imply that while overall enjoyment may be moderate or average, the portal is performing particularly well in terms of how effective and efficient it is perceived to be. If these dimensions were critical to system performance, then the higher ratings in effectiveness and efficiency are positive signs, even if enjoyment remains on par with expectations. The results show significant differences in effectiveness and efficiency ($p < 0.001$), suggesting these dimensions meet user expectations. However, enjoyment does not show significant improvement ($p = 0.273$), indicating enjoyment remains a critical issue.

Table 1 evaluates whether the overall score of the portal exceeds the hypothetical mean of 72.

Table 1 T-Test Results for Enjoyment, Effectiveness, and Efficiency

Dimension	N	Mean	Std. Deviation	t- value	df	Sig. (2- tailed)
Enjoyment	100	24.59	5.36	1.102	99	.273
Effectiveness	100	26.11	5.58	3.782	99	.000
Efficiency	100	26.87	5.63	5.093	99	.000
Overall score	100	77.57	15.03	3.705	99	.000

The mean score of 77.57 significantly exceeds the hypothetical mean of 72 ($p = 0.000$), suggesting that users recognize some strengths of the portal. However, this does not align with the reported dissatisfaction, highlighting the need for qualitative insights into usability challenges.

Table 2 compares enjoyment, effectiveness, and efficiency scores between male and female users, revealing no significant differences. This indicates that the usability issues and overall user experience are consistent across genders

Table 2 Gender Comparison

Dimension	Gender	N	Mean	Std. Deviation	t-value	df	Sig.(2-tailed)
All Items	Male	37	76.68	18.80	-0.454	98	0.651
	Female	63	78.10	12.44			
Satisfaction	Male	37	24.73	6.37	0.199	98	0.843
	Female	63	24.51	4.71			
Effectiveness	Male	37	25.54	6.67	-0.781	98	0.474
	Female	63	26.44	4.86			
Efficiency	Male	37	26.41	7.04	-0.630	98	0.572
	Female	63	27.14	4.66			

Significant differences are observed among age groups ($p = 0.05$). Users aged 50+ report the highest enjoyment, while younger users (20–30) report the lowest, as table 3 illustrates. This suggests a need to tailor the portal's design to meet the expectations of younger users.

Table 3 Age Group Comparison

Age Group	N	Mean	Std. Deviation
20–30	9	64.67	12.48
31–40	35	78.54	17.05
41–50	44	77.75	12.47
Above 50	12	83.75	15.25
Total	100	77.5700	15.03212

Table 4 shows ANOVA results which indicate greater variability in mean portal usage scores between age groups than within groups (F -value = 3.127). The mean scores show a clear upward trend with age, where participants aged 20–30 report the lowest mean score (64.67), while those above 50 years report the highest (83.75). This suggests that older faculty members experience higher satisfaction or perceive the portal as more usable compared to their younger counterparts. The calculated p -value ($p \approx 0.029$) confirms that there are significant differences in mean portal usage scores across the age groups at the 5% significance level. This supports the earlier interpretation that age influences user experiences and satisfaction with the portal. Furthermore, the between-group variance (Mean Square = 663.775) is substantially larger than the within-group variance (Mean Square = 212.283), providing statistical support for the existence of meaningful differences in portal experiences across age groups.

Table 4 ANOVA analysis for Age Group Comparison

Source of Variation	Sum of Squares	df	Mean Square	F	P-value
Between Groups	1991.324	3	663.775	3.127	0.029
Within Groups	20379.186	96	212.283		
Total	22370.510	99			

Table 5 presents the Mean portal usage scores across different occupational categories. Faculty members constitute the largest group ($N=74$) with a mean score of 79.39 and a standard deviation of 15.30, indicating generally positive experiences with the portal alongside moderate variability within the group. Teaching assistants ($N=18$) report a notably lower mean score of 70.89 with a similar standard deviation of 14.86, suggesting that this group experiences more challenges or lower satisfaction compared to faculty members. Employees ($N=8$) have a mean score of 75.75 with a smaller standard deviation of 7.94, reflecting relatively consistent but slightly less positive experiences than faculty members. Overall, the total mean score across all occupational groups is 77.57 ($SD = 15.03$). These results imply that faculty members perceive the portal most favorably, while teaching

assistants exhibit the lowest satisfaction, highlighting a potential need for targeted usability support or training for teaching assistants to improve their portal interactions.

Table 5 Occupation Group Comparison

Occupation	N	Mean	Std. Deviation
Faculty Members	74	79.39	15.30
Teaching Asst.	18	70.89	14.86
Employee	8	75.75	7.94
Total	100	77.57	15.03212

Table 6 revealed a borderline statistically significant effect of occupation, $F(2, 97) = 2.450$, $p = 0.091$, with the between-group sum of squares at 1075.597 and a corresponding mean square of 537.799, compared to a within-group mean square of 219.535 ($SS = 21294.913$). These results suggest that occupation may play a role in influencing performance.

Table 6 ANOVA analysis for Occupation Group Comparison

Source of Variation	Sum of Squares	df	Mean Square	F	P-value
Between Groups	1075.597	2	537.799	2.450	0.091
Within Groups	21294.913	97	219.535		
Total	22370.510	99			

The descriptive statistics, shown in Table 7, reveal that participants with a PhD degree ($M = 84.47$, $SD = 13.63$) obtained the highest mean score, while those holding a university degree ($M = 74.05$, $SD = 10.00$) recorded the lowest.

Table 7 Education Level

Education level	N	Mean	Std. Deviation
Higher diploma	3	75.6667	6.35085
University degree	21	74.0476	10.00238
Master's degree	61	77.1803	16.68084
PhD Degree	15	84.4667	13.62700
Total	100	77.5700	15.03212

Despite these differences, the ANOVA analysis indicated that the effect of education level was not statistically significant as seen on table 8, $F(3, 96) = 1.488$, $p = 0.223$. The between-group variability ($SS = 994.141$) was minimal compared to the within-group variability ($SS = 21,376.369$), suggesting that the observed differences in means are likely attributable to random variation rather than systematic differences between the education levels.

Table 8 ANOVA analysis for Education Level

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	994.141	3	331.380	1.488	0.223
Within Groups	21376.369	96	222.671		
Total	22370.510	99			

A one-way ANOVA was conducted to assess whether the type of administrative procedure (Updating Data, Registration, and resumption of duty) significantly affects the measured outcome shown in table 9. The descriptive statistics indicate that the Updating Data group ($n = 67$) had a mean score of 77.42 ($SD = 15.42$), the Registration group ($n = 13$) had a mean of 75.23 ($SD = 17.67$), and the Work Assignment group ($n = 20$) had a mean of 79.60 ($SD = 12.07$).

Table 9 types of administrative procedures

Procedure	N	Mean	Std. Deviation
Updating Data	67	77.42	15.42
Registration	13	75.23	17.67
Resumption of duty	20	79.60	12.07
Total	100	77.5700	15.03212

The ANOVA shows no significant difference in mean scores by administrative procedure type ($F = 0.339$, $p = 0.713$) illustrated in table 10. This means that whether participants use the portal for updating information, registration, or work assignment, their satisfaction and usability experience remain similar — reinforcing that design improvements should address general system usability.

Table 10 ANOVA analysis for administrative procedures

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	P-value
Between Groups	155.104	2	77.552	0.339	0.714	0.713
Within Groups	22215.406	97	229.025			
Total	22370.510	99				

The analysis revealed that the differences among these means were not statistically significant, $F(2, 97) = 0.339$, $p = 0.714$. The small between-group variance ($SS = 155.104$) relative to the within-group variance ($SS = 22,215.406$) suggests that most of the variability in scores is due to individual differences rather than the type of procedure.

The correlation analysis reveals strong, positive relationships among the dimensions of the scale and the total score as can be seen in table 11. Specifically, enjoyment is highly correlated with effectiveness ($r = 0.707$, $p < 0.01$), efficiency ($r = 0.678$, $p < 0.01$), and the overall total score ($r = 0.873$, $p < 0.01$). Similarly, effectiveness exhibits a robust correlation with efficiency ($r = 0.815$, $p < 0.01$) and an even stronger association with the total score ($r = 0.928$, $p < 0.01$). Efficiency also correlates strongly with the total score ($r = 0.919$, $p < 0.01$). These results indicate that all dimensions of the scale are highly interrelated and contribute significantly to the overall construct, thereby supporting the convergent validity of the measurement

Table 11 Correlation Analysis

Dimension	Satisfaction	Effectiveness	Efficiency	Overall Score
Satisfaction	1	0.707**	0.678**	0.873**
Effectiveness	0.707**	1	0.815**	0.928**
Efficiency	0.678**	0.815**	1	0.919**
Overall Score	0.873**	0.928**	0.919**	1

Discussion

This research has been conducted to evaluate the usability and user enjoyment of the Libyan Ministry of Higher Education's portal by examining key dimensions— satisfaction, effectiveness, and efficiency—and their interrelationships. The analysis incorporated quantitative measures, including t-tests, ANOVA, and correlation analyses, as well as demographic insights and task execution patterns to provide a comprehensive overview of the portal's performance.

The descriptive data revealed that the overall user performance score was moderately high ($M = 77.57$, $SD = 15.03$). A notable finding is that most respondents (87%) prefer to perform administrative tasks independently, suggesting that the portal is generally user-friendly for most. However, the 13% of users who require assistance may be indicative of specific usability challenges such as Digital illiteracy and inadequate help features. Furthermore, among the administrative tasks, updating data emerged as the most frequently used feature (67%), underscoring its importance to the user experience. Additionally, the one-way ANOVAs examining differences across administrative procedures and education levels found no significant effects. This suggests that, regardless of the procedure type or educational background, users generally experience similar levels of performance on the portal.

The observed data showed very strong positive relationships between satisfaction, effectiveness, and efficiency (all correlations above 0.67, $p < 0.01$). This means that when one of these dimensions improves, the others tend to improve as well, showing that these aspects of user experience are closely linked. Such strong intercorrelations offer robust evidence for the convergent validity of the measurement instrument, indicating that the items designed to assess each of these constructs are indeed capturing related facets of user experience. In simpler terms, the data confirms that the tools employed provide a reliable measure of overall user experience

Despite the integration of user data from the Civil Registry Office and datasets provided by Libyan universities, participants reported several technical challenges while registering with the portal. One of the most common issues was the inability to update or modify certain personal information, even when corrections were necessary. This restriction created frustration among users, particularly when outdated or incorrect details hindered their ability to complete administrative tasks. Additionally, participants expressed concerns about the lack of clear guidance on task requirements. Many reported that they were not adequately informed about the steps needed to complete specific processes or the type of information required for each task. This lack of transparency and instructional

support contributed to errors, incomplete submissions, and unnecessary delays. Addressing these issues by improving system flexibility for data updates and enhancing task-specific guidance would significantly enhance the portal's usability and overall user satisfaction.

Another critical issue was the system's failure to provide clear and immediate feedback when users performed actions. The absence of informative error messages, confirmation prompts, or status updates often led to confusion, as users were unsure whether their submissions were successful or if further steps were required. Without real-time feedback, users frequently encountered delays, repeated actions unnecessarily, or abandoned tasks altogether. This lack of communication not only affected user efficiency but also contributed to a negative perception of the portal's reliability. Addressing these issues by **improving system flexibility** for data updates, **enhancing task-specific guidance**, and **incorporating real-time feedback mechanisms** would significantly enhance the portal's usability and overall user satisfaction.

Conclusion

This study evaluated the usability and user satisfaction of the Libyan Ministry of Higher Education's e-government portal, focusing on key dimensions such as effectiveness, efficiency, and enjoyment. The findings indicate that while the portal demonstrates strong functional performance, particularly in task execution efficiency and system effectiveness, overall user satisfaction remains an area for improvement. Several challenges were identified, including restricted data update capabilities, lack of clear task instructions, and inadequate feedback mechanisms, which contributed to confusion and inefficiencies in user interactions.

The strong correlations among satisfaction, effectiveness, and efficiency suggest that improvements in one area can positively impact the others. Enhancing the user interface, simplifying administrative procedures, improving feedback mechanisms, and providing clear guidance on task completion are critical steps toward optimizing the user experience.

Ultimately, improving the portal's usability will not only enhance user engagement but also support the broader goal of digital transformation in Libya's higher education sector. By implementing user-centered design improvements and addressing technical shortcomings, the portal can evolve into a more accessible, efficient, and reliable tool, facilitating seamless administrative processes for its diverse user base.

Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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