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BRIDGING FUNCTIONALITY AND USABILITY: A POST-IMPLEMENTATION STUDY OF AN ACADEMIC ARCHIVING SYSTEM

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ABSTRACT
This study examines the usability of the TrackRight digital archiving system implemented at a college registrar's office. Besides achieving the system's functional objectives, users experienced certain difficulties that affected their normal work. A mix of research methods, including questionnaires, expert evaluations, interviews, and activity observations, revealed that problems arising from unsystematic interface design, inadequate error handling, and interrupted workflows between real and digital tasks were the major constraints on effective use. Users have chosen different approaches to the problems to varying degrees, depending on the nature of the issue. On the basis of a three-level improvement plan, standardization of interface components, provision of informative error messages, and enhanced integration of the physical and digital processes have been prioritized. Such changes are expected to increase productivity, reduce errors, and enhance the system's user-friendliness. The paper demonstrates the significance of usability in the field of educational administrative equipment and provides very specific instructions for comparable institutions engaged in digital transformation. Like other studies that have identified a usability gap in educational administrative systems, the present research identifies the main usability obstacles hindering the adoption of the system in a developing country context.

Keywords:
Track Right digital archiving system, usability, educational administrations, interface design, error handling, workflow integration, user workarounds, system improvement, academic record management, human-computer interaction

INTRODUCTION
Digital transformation in education administration has accelerated globally, with institutions increasingly adopting specialized software to manage academic records (Gracia & Lee, 2022). However, administrative systems often face a usability-functionality gap, where functional compliance does not translate into user satisfaction or operational efficiency (Johnson & Chen, 2020; Nagrama et al., 2024). This difference is especially noticeable in schools, where staff might not have the necessary technical skills. Therefore, the software must be very user-friendly (Martinez, Thompson, & Williams, 2023).
In countries with an emerging economy like the Philippines, the combination of localization and cultural aspects in the provision of software brings about several issues concerning software acceptance and usability (Santos, 2021). To be more specific, Philippine universities experience these problems because, on one hand, they have to update their ways of running things and, on the other hand, they have to face a lack of resources and a user base with different levels of technology knowledge (Garcia, 2022). Although usability is a major factor in the acceptance of any system, only a handful of researches have looked at how well the administrative system works after its implementation in such settings.
The Saint Columban College Registrar's Office implemented the TrackRight digital archiving system in 2024 to address manual processing bottlenecks in academic record management. While the system achieves its functional objectives, the users' usability problems remain largely unattended. This research work tries to bridge

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this gap by assessing the usability of TrackRight in a real world context, using human-computer interaction theories to decipher issues related to workflow integration and user experience (Nielsen, 1994; Chen & Kumar, 2022).

The primary research question guiding this study is: What specific usability challenges do registrar staff encounter when using the TrackRight digital archiving system, and how might these challenges be addressed through user-centered design improvements?

METHODOLOGY

RESEARCH DESIGN

This study employed a descriptive-evaluation design using mixed methods to comprehensively assess the TrackRight system's usability. The multi method approach incorporates quantitative data and qualitative information to enable the cross, verification of the results and a more comprehensive understanding of user experience problems (Creswell & Plano Clark, 2017).

PARTICIPANTS

Fifteen (15) staff members of the registrar's office of Saint Columban College took part in the research. These staff members belong to all the user roles as per the TrackRight system, which were: 3 Administrative users (full system access), 10 Staff users (standard access), 2 Student Grant users (limited access). At the time of the study, the participants had been using the system for 3-4 months. Their ages were between 24 and 52 years with the average age of 38.7 and the standard deviation of 8.3 years. Besides, their prior experience in using digital archiving systems ranged from "none" (6 participants) to "extensive" (3 participants). This variation in technical expertise among the participants corresponds to typical issues faced in the adoption of educational administrative systems (Martinez et al., 2023). All participants volunteered with informed consent, and ethical approval was obtained from the Saint Columban College Research Ethics Committee (Approval #SCC-REC-2024-015).

DATA COLLECTIONS INSTRUMENTS AND PROCEDURES

The data for this study was collected over a period of 4 weeks from 4th to 29th November of 2024. The data collection period was aligned with the academic peak processing activities to validate the system under actual workload conditions.

- **Heuristic Evaluation:** Two separate HCI specialists performed the evaluations utilizing Nielsen's (1994) 10 usability criteria. Each evaluators reviewed the complete set of 12 major system modules, as depicted in the TrackRight documentation. Assessment was done by means of a uniform checklist (Appendix A) that also included severity ratings (0,4 scale) for each heuristic violation.
- **System Usability Scale (SUS):** Each participant completed the standard 10-item SUS questionnaire (Brooke, 1996), which had been translated into Filipino and verified by back translation. SUS is a reliable and quick tool for measuring perceived usability with scores varying from 0 to 100. The procedures recommended by Bangor, Kortum, and Miller (2008) were followed for the administration.
- **Semi-structured Interviews:** Five participants (selected to represent all user roles and experience levels) participated in 20–45-minute interviews focused on workflow integration, feature effectiveness, error experiences, training adequacy, and improvement suggestions. The interviews were audio recorded and then transcribed word for word.
- **Task Performance Observation:** Participants completed six typical tasks (e.g., credential search, document scanning, printing certification). The participants' performance was determined by completion time, error rates, help requests, and observed workarounds.

DATA ANALYSIS

Quantitative data (SUS scores, task times, error counts) using SPSS version 28. The SUS score was computed using the traditional method, in which item scores are summed to obtain the overall SUS score on a 0-100 scale. Before running parametric tests, the researchers checked the statistical assumptions. Researchers used the Shapiro-Wilk test and Q-Q plots to assess normality. The SUS scores approximated a normal distribution ($W = 0.94$, $p = 0.38$), supporting the use of t-tests for group comparisons. Levene's test confirmed homogeneity of variances between user groups ($F = 1.24$, $p = 0.29$). For non-normally distributed variables (e.g., task completion times, which showed positive skew), non-parametric alternatives (Mann-Whitney U tests) were employed to verify parametric results; no substantive differences in interpretation were found.

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Qualitative data from interviews and observational notes were analyzed using thematic analysis following Braun and Clarke's (2006) six-phased approach. The first step was to code the data inductively, and the next step was to group the codes into themes through iterative review.
Heuristic evaluation findings were consolidated, and severity ratings were averaged across evaluators. Inter-rater reliability was calculated using Cohen's kappa (k = 0.78, indicating substantial agreement).

RESULTS

System Usability Scale Findings

The TrackRight system received an average SUS score of 58.5 (SD = 12.3, 95% CI [51.7, 65.3]), below the generally accepted benchmark of 68 for acceptable systems (Bangor et al., 2008). Scores ranged from 35 to 82.5 which showed that users perceptions varied widely. Administrative users gave slightly higher ratings (M = 57.1, SD = 12.1), but the difference was not statistically significant (t(11) = 1.24, p = 0.23). The effect size, calculated using Cohen's d, was 0.56 (95% CI [-0.48, 1.59]), indicating a medium practical effect despite the lack of statistical significance.
Note: Shapiro-Wilk test not computed for groups with n < 3.

User Group	n	Mean	SD	95% CI	Median	Range	Shapiro-Wilk (p)
Administrative	3	63.3	8.5	[42.2, 84.4]	65.0	55-72	0.42
Staff	10	57.1	12.1	[48.5, 65.7]	56.3	35-82.5	0.51
Student Grant	2	60.0	10.6	[-35.2, 155.2]	60.0	52-68	-*
Overall	15	58.5	12.3	[51.7, 65.3]	57.5	35-82.5	0.38

Table 1. Statistical Summary of SUS Scores by User Group

Individual item analysis revealed particular weaknesses in:

- **Item 3:** "I thought the system was easy to use" (M = 2.1/4)
- **Item 5:** "I found the various functions in this system were well integrated" (M = 2.3/4)
- **Item 8:** "I found the system very cumbersome to use" (M = 2.9/4, with higher scores indicating greater agreement with this negative statement)

Heuristic Evaluation Results

The expert evaluator identified 47 distinct heuristic violations across the system. The most severe violations (average severity ≥ 3.0) included:

1. Consistency and standards (Severity: 3.5): Different modules have navigation patterns, button placements, and labelling variations (e.g., "Save" vs "Confirm") that are inconsistent.

2. Error prevention (Severity: 3. 2) The problems are: lack of confirmation dialogs when performing irreversible operations, insufficient validation while scanning documents, and no alert of unsaved changes in the Settings module.

3. Help and documentation (Severity 3.0) There was no context-sensitive help, and the manual that is available did not cover a number of typical workflow scenarios.

Table 1 summarizes the heuristic violations by frequency and severity:

Heuristic Principle	# Violations	Avg Severity (0-4)
Visibility of system status	6	2.5
Match between system and real world	4	2.0
User control and freedom	5	2.8
Consistency and standards	9	3.5
Error prevention	7	3.2
Recognition rather than recall	5	2.3
Flexibility and efficiency	4	2.5
Aesthetic and minimalist design	3	1.8
Help users recognize/diagnose/ recover errors	2	2.5
Help and documentation	2	3.0

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Table 2. Heuristic Violations Summary

Task Performance Observations

Task completion rates varied significantly across different system functions:

Task	Avg Time (min)	Success Rate	Avg Errors	Workarounds Observed
Search Student	1.2	100%	0.3	0.2
Scan Document	4.8	73%	2.1	1.5
Print Certification	3.2	87%	1.3	0.8
Upload Form 9	2.4	93%	0.8	0.4
Backup Data	1.8	100%	0.2	0.1
Modify Settings	5.1	60%	2.8	2.3

Table 3. Task Performance Metrics

The task of scanning especially caused difficulties with 27% of attempts needing help from a supervisor. The task of changing settings had the lowest success rate as participants very often failed to save their changes or simply lost their configurations while moving between sections of the application.

Interview Themes

Workflow Integration Challenges

Participants expressed that it was hard for them to combine system use with physically handling the documentation: I have to keep switching between the scanner and the keyboard it breaks my concentration (P4, Staff). The division of search, scan, and print functions into different modules interfered with the flow of natural work sequences.

Error Recovery Frustration

When mistakes happened, especially in scanning, it was very confusing how to recover: “Sometimes the scanner gives up halfway, and I have to start over everything. The system do not tell us the error, of what is going on” (P2, Admin).

Learning Curve Concerns

While basic functions were learned quickly, advanced features remained underutilized: “I only use half of what the system can do. The other buttons, I’m afraid to click because I might break something” (P7, Staff).

Adaption and Workarounds

All participants had developed personal workarounds for system limitations, averaging 3.2 distinct adaption per user. Common workarounds included using paper notes as intermediaries, restarting processes after partial failures and avoiding certain feature altogether.

DISCUSSION

The below-average SUS score (58.5) fundamentally confirms the heuristic evaluation findings: TrackRight achieves its functional objectives but falls significantly short in user experience design. The gap between functionality and usability reflects the same patterns witnessed in educational administrative systems (Williams, 2021; Johnson & Chen, 2020) and appears more evident in the Philippine Higher Education setting, where localization and cultural elements influence technology adoption (Santos, 2021; Garcia, 2022).

The scanning module is a major source of concern especially given that it scored poorly on performance metrics (73% success rate, 2.1 average mistakes). The metrics severely restrict the system which is mostly oriented towards the digitization of documents. One of the causes of these problems persisting could be an error in the mistake, prevention heuristics (Severity 3.2) that makes the users unsure of the status of the operation when they only get a minimal update during the scanning process. These disruptions to the workflow are in line with the

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findings of Chen and Kumar's (2020) systematic review of usability issues in administrative software, which, among other things, looks at error, prevention mechanisms.

The low success rate (60%) and high error count (2.8 average) of the settings module pointed to a general weakness in administration software: configuration interfaces are usually given less attention for usability than main functions, although they have a major impact on the overall performance of the system (Chen & Kumar, 2022). Users quite often forgot changes or got confused when they switched between different settings sections, which was at the same time a violation of the heuristics of "consistency and standards" and "user control and freedom".

Besides that, the above-average user workarounds rate (3.2 per user) further highlights the strong gap between the system's features and users' needs. This gap has been widened due to the lack of technical training and the cultural features of the Philippine educational setting (Santos, 2021; Garcia, 2022). The present findings contribute to the literature by presenting real-world data from a developing country setting, thereby underscoring the need for user-focused design strategies that account for local ways of working and skills.

This study's findings pinpoint breakdowns in work processes when switching from physical to digital document handling, offering a more detailed view of the digital transformation issues raised by Garcia (2022). The proposed enhancement addresses these problems by making the interface more consistent, providing clearer error feedback, and integrating workflows that follow usability engineering best practices (Nielsen, 1994), thereby supporting the effective adoption and continued use of the devices.

Arguably, the biggest single eye-opener to emerge from this research is that users created an average of 3.2 distinct workarounds per person to cope with the system. These different user adaptations, from surviving with paper notes as a kind of "translator" between the old and the new systems to outright rejection of certain features, are more than just expressions of user preferences. They are a social phenomenon that highlights the fundamental incongruities between system design and how people actually work.

Following Vogelsang et al. (2023), workarounds emerge when the "affordances" of a system the action possibilities that users perceive as available fail to align with their practical needs. In the context of TrackRight, users were not simply selecting alternative methods; they were essentially making up for the shortcomings in design by manual interventions. It is the very fact that all 15 participants, with different degrees of technical skills, came up with workarounds that points to the issues being at the system level rather than the individual one.

These workarounds carry high organizational costs. First, they introduce inconsistency in task execution, making quality control difficult. Second, they represent hidden cognitive load users: must remember not only the "correct" system procedure but also their personal workaround strategies. Thirdly, these manual interventions prevent the full achievement of the expected efficiency gains from the digital transformation since, in effect, they reintroduce the paper-based processes that the system was intended to do away with.

From a sociological perspective, the presence of workarounds to this extent indicates that TrackRight users are not simply passive in their adoption of technology, but rather human actors actively shaping technology use to fit their work environments (Alter, 2023). On the other hand, this agency is only a response to the design shortcomings, not an intentional, creative modification. The fact that workarounds are still being used even after 3 to 4 months of system use indicates that users may have become so accustomed to these adaptations that they are hiding the real usability issues from management and developers.

The usability issues unveiled here indeed have a profound impact on technology acceptance when viewed through the lens of well-known theoretical frameworks. The Technology Acceptance Model (TAM) maintains that a user's perception of how easy a system is to use (PEOU) not only affects how useful they think the system is but also significantly influences whether they actually adopt the system and continue to use it (Davis, 1989; Venkatesh et al., 2023). In conjunction with this, the Unified Theory of Acceptance and Use of Technology (UTAUT2) illustrates effort expectancy as one of the most important predictors of behavioral intention (Venkatesh, Thong, & Xu, 2012).

The "interrupted workflows" documented in Section 3.4.1 represent a direct assault on Perceived Ease of Use. When users have to keep changing from scanner to keyboard, or have to translate in their minds between physical documents and digital interfaces, the amount of work required to complete the task will increase significantly. This high level of effort expectancy means that the users will be less likely to continue using the system over time, which is a problematic finding for an archival system that depends on consistent, long, term use for the integrity of the data.

A below-average SUS score of 58.5 is operationalized by this low PEOU, placing TrackRight in the TAM-identified "resistance zone" where users comply with the system (because it is a requirement) but do not accept

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it. The frequent use of workarounds is a further indication of this phenomenon; users don't really engage with the system but instead put effort into finding ways around it. This is a behavior that is, at the very least, barely adoption and, at most, is deep integration of the non-use of the system.

While the difference in SUS scores between admin and staff users (M=63.3 vs. M=57.1) was a bit statistically significant, it still points to the moderating roles of experience and voluntariness, from a UTAUT perspective. Admins, who had wider system access and a higher level of involvement in decision-making, had a slightly higher perception of the system's ease-of-use; thus, user involvement in the design of the system might be a shelter from the frustration in using the system.

The theoretical links here highlight that these suggested changes are far from being only user satisfaction solutions. They are about the viability of the digital transformation initiative over the long term. A product or service that does not score well on Perceived Ease of Use is at risk of being labeled as an island of automation. This means that such products or services are technically functional but are very rarely used and thus can be regarded as an investment wasted (Johnson & Chen, 2020).

Drawing on the combined results from the SUS scores, heuristic evaluation, and task performance metrics, and user interviews, the author presents a three-tire improvement framework that aims to methodically deal with the originally detected usability shortcomings:

Level 1: Interface Standardization and Consistency

This foundational level targets the most frequently violated heuristic principle, consistency and standards (severity 3.5). Specific interventions include:

• Standardizing button label and positions across all 12 modules (e.g., consistently using “Save” rather than alternating with “Confirm,” “Submit,” or “Update,”)
• Aligning navigation patterns and menu placements to reduce cognitive load during module switching
• Implementing uniform color coding for similar functions (e.g., all destructive actions in red)
• Creating a design system documentation to ensure future modules maintain consistency

Level 2: Semantic Error Prevention and Recovery

Addressing the severe error prevention violations (severity 3.2) and the 2.8 average errors in settings modification, Level 2 focuses on:

• Implementing confirmation dialogs for all irreversible operations (e.g., batch deletions, permanent record removal)
• Redesigning error messages to be informative rather than generic, specifying exactly what went wrong and how to resolve it (e.g., “Scanner connection lost: Please check USB cable and click ‘Retry’ instead of 'Scan Failed')
• Adding progressive indicators for long operations (scanning, backup) with estimated completion times
• Implementing auto-save functionality in the Settings module with version history to prevent configuration loss

Level 3: Physical-Digital Workflow Synchronization

This highest level tackles the workflow integration challenges that emerged strongly in interviews:

• Redesigning the scanning workflow to minimize context switching between physical documents and digital interfaces
• Creating task-based navigation paths that mirror natural work sequences (e.g., “Process New Student Record” combining search, scan, and save operations)
• Integrating barcode or QR code scanning to automatically link physical documents to digital records
• Developing a “quick actions” panel that remembers frequently performed task combinations per user role

Estimate Impact of Improvements

Based on similar system enhancements documented in literature (Johnson, 2020; Chen & Kumar, 2022), we estimate that implementing the immediate and medium-term improvements could:

• Reduce task completion times by 25-35%
• Decrease error rates by 40-50%
• Increase SUS score to the acceptable range (68+)
• Reduce training time for new staff by approximately 30%

Fully rolling out Level 3 changes, which drastically alter the workflow, would most probably lead to more users being highly satisfied and the product being used for a longer time, although these advantages are harder to measure in advance.

Limitations

This research, however, suffers from several limitations. First of all, since it is a unit case study of one institution only, the findings may not be transferable to other contexts with different user populations or

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workflows. Secondly, the total number of participants (n=15) that is quite small limits statistical power, although it comprises the entire population of the TrackRight system users at the institution. Four groups being both small and unbalanced restrict the statistical power to detect between, group differences. Reported confidence intervals and effect sizes, therefore, allow for a more meaningful interpretation than p, values only and this is in accordance with contemporary recommendations for quantitative research in HCI (Lazar et al., 2024; Sauro & Lewis, 2024).

Thirdly, the very fact that researchers were there while the task performance observations were being made might have caused an observer effect (Hawthorne effect). Put another way, the participants might have changed their behavior just because they knew that they were being watched (Landsberger, 1958). This problem is a major methodological concern in observational research and has been the subject of many discussions, especially in the case of usability studies. These studies are strongly affected when the presence of the observer changes the subject's behavior, thus the performance, especially if aiming at the performance of complicated or unfamiliar tasks (Macefield, 2007; Sauro, 2017). It could have influenced the time spent on the tasks, the number of errors that the participants made, and the frequency of workarounds that were noticed, thus possibly distorting the real usage patterns of the system.

Fourth, the SUS questionnaire was first translated into Filipino and then back, translated for verification; however, the specific validation aspects of this translation seem to have been overlooked. Back, translation is a helpful method for ensuring semantic equivalence, but a full psychometric validation (such as a factor analysis, reliability testing with a larger Filipino sample) was not conducted, which probably affects the cross, cultural validity of the SUS results.

Fifth, potential response bias may have influenced the self-reported data. Participants might have provided socially desirable responses during interviews or SUS questionnaires, particularly when discussing difficulties with the system, given that the system was institutionally mandated. The combination of self-reported and observational methods partially mitigates this concern through triangulation, but response bias cannot be entirely eliminated.

Sixth, the research measured system usage only once (3 - 4 months after the start of the implementation); more data over time might show different user behaviors as they get more acquainted with the system. Last but not least, mixed methods research provides detailed data, but it is not able to demonstrate a causal relationship between particular design features and the usability results.

CONCLUSION

This post-implementation usability study of the TrackRight digital archiving system reveals significant opportunities to improve the user experience, despite the system's functional adequacy. Low system usability score (SUS) of the system (58.5), a large number of heuristic violations (47 identified), as well as the high number of user workarounds (3.2 per user), are a clear indication that usability was not really the main priority during the development process.

Some major problematic areas are the inconsistency of interface design, poor error prevention and recovery mechanisms, and interruptions in the flow of work due to the physical and digital processes. An improvement proposal is basically a document that both visually and logically depicts the problems and the way to enhance user experience. Should these changes be made, system efficiency may be greatly improved, the error rate may be lowered, and staff satisfaction may increase.

This study contributes to both practice and theory aspects. In practice, it empirically demonstrates, through the operational system, how such a system can be improved. On the other hand, it sheds light on culture, linguistics, and institutional factors as possible areas of interaction and usability principles, while extending the area of research, human-computer interaction (HCI), to the less-studied setting of the administrative systems of higher education institutions in the Philippines.

Future research might focus on how improving usability over time affects actual work outputs (e.g., processing times, error rates) rather than just users' perceptions. Comparative research between different educational institutions could reveal which usability issues are universal and which are specific to the context. Moreover, a study identifying the costs and benefits of usability investments in administrative systems would be a great help to institutions in deciding the priority between user experience and other functional requirements.

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