

Research Article

Digitizing Debt Restructuring Workflows: The Development of a Web-Based Installment Plan Management System (IPMS)

Ammar Aidil Mohd Azudin¹, Ts. Inv. Mohd Zafian Mohd Zawawi², Noor Rahmawati Alias³

¹ Faculty of Information Science UiTM Kelantan; 2024645842@student.uitm.edu.my

² Faculty of Information Science UiTM Kelantan; zaffian@uitm.edu.my

³ Faculty of Information Science UiTM Kelantan; rahmawati@uitm.edu.my

* Correspondence: email;

Keywords:

Installment Plan

Digitising

RBAC

UML

FinTech

Abstract: Legacy paper-based distribution of installments has resulted in administrative bottlenecks and calculation errors. To provide a solution to this issue, a web-based Installment Plan Management System (IPMS) was built with a 3-Tier architecture that automates the workflow using PHP/MySQL. Testing indicated that the IPMS removed all manually calculated errors in distribution and optimized application processing time. Through the use of real-time dashboards and Role-Based Access Control, the IPMS greatly improved transparency of organisations and provided a standardised methodology to ensure compliance with policy. Digitising this workflow results in an efficient and scalable solution that improves administrative oversight and overall customer experience.



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. INTRODUCTION

Currently, the critical installment plan process for customers with overdue balances depends on hard-copy manual forms which result in errors & became bottlenecks, increasing the chances of documents being lost, having no real-time tracking. This initiative also proposes a web-based Installment Plan Management System (IPMS) that is to centralize and automate the entire installment lifecycle: start from the electronic form submission, document attachments, automated status notifications, and provide the management dashboard for monitoring all active plans. Furthermore, the IPMS will ensure that standardized information is captured at its source on a secure and transparent digital environment using a centralized data repository; therefore, addressing the three core principles (data integrity, process efficiencies and technology governance) of management of Information Systems. Ultimately, the solution will offer an expandable platform that will help reduce the reliance

on paper (environmentally friendly), enhance employee productivity and provide Finance with better overall service.

2. LITERATURE REVIEW

2.1 Technological Structure and Data Systems Design

Central to a contemporary IPMS is an artificial intelligence-based credit decision-making system that is significantly different from traditional credit scoring methods. Academic experts view this innovation through the framework of Financial Technology (FinTech) innovation (Gabor & Brooks, 2017). Gabor and Brooks suggest that the future of retail finance rests on how well we are able to use non-traditional data points to algorithmically construct creditworthiness based on the "datafication of the customer." An effective IPMS incorporates Application Programming Interface (API) technology to bring together data from bank transaction data, device metadata, and behavioural analytics in real-time (within milliseconds). This is accomplished through a modularized system consisting of three main components: a merchant portal for point-of-sale integration, a consumer-facing dashboard to provide cognitive transparency, and a back-end engine for collection and reconciliation purposes.

3. METHODOLOGY

The software development is a project with Agile Development Methodology as its primary method by developing all core components using multiple iterations through sprints; an example is the digital form submission component that will be tested by its users within the corporation as they develop their business, providing real-time adaptations based on new company policies when changes occur within the company. The software development will also follow a Model-View-Controller (MVC) architecture separating the user interface from the complicated calculation logic (for installing installments), thus providing scalability and maintainability. A complete set of design documentation will be maintained throughout the project, which will also include proper data movement between the existing manual request process and the next well-defined digital approval process (mapping data movement via use of Unified Modeling Language (UML) diagrams such as Use Case and Data Flow Diagrams); to accomplish this, there will also be one (1) complete Entity Relationship Diagram (ERD) produced to document how the relational data is organized to connect all customers being paid, all installment payment schedules, and all authorization logs while ensuring the prevention of undesired duplicate data and providing a complete audit trail to receive. A comprehensive data dictionary will also be developed that describes and specifies all data types and validation constraints. The system will be built on either a modern web stack with PHP/Laravel or Python/Django to store data securely using MySQL. Finally, verification through unit testing for each component will be done thoroughly, as well as user acceptance testing (UAT).

4. FINDINGS

An improvement in operational efficiency was evident from the installation of the Installment Plan Management System (IPMS). The results of the testing phases demonstrate how much quicker the processing of new applications became by replacing the manual routing of physical documents (i.e. completion of PB01 and PB02 forms) with a centralized digital workflow. A successful implementation of the Role-Based Access Control (RBAC) achieved the segregation of certain duties, so that submitted

applications could be populated in the Verification Queue (where they will remain until staff members verify the information), and once verified, routed to the Approval Queue (where they will remain until approved) (Ahmad, 2022; Mohamad & Ali, 2019). Automation created an effective pipeline free of any bottlenecks caused by handing-off completed forms physically to individuals and reduced the chance of form misplacement.

4.1 Financial Structuring and Accuracy

The tool accomplished a very high accuracy regarding financial structuring via its automatic calculation facility. The tool utilized a strict limitation on repayment options for repayment durations by only allowing standard terms of 6, 12, or 24-month loan durations to produce an exact monthly installment breakdown of repayment amounts in Ringgit (RM) without any manual computation. All customers will be able to receive a preview of their schedule(s) in real time, providing the opportunity to immediately validate the accuracy of data entered. In addition, an immutable audit log was implemented for the purpose of recording administrative actions, including the successful recording of the audit trail (timestamped) to verify and authorize for each unique application identifier (Rahman, 2023).

4.2 Organizational Impact and Transparency

According to our research, digitization of old administrative functions into the IPMS resolves the inefficiencies of using a paper administrative system—such as digitizing legacy administrative functions. This is done by using technology to automate both the calculation and routing of transactions, thereby addressing the high likelihood that human error will occur during manual data entry and financial estimation; and by enforcing strict payment parameter compliance, the applicant process is standardized and will not be subject to arbitrary decision-making (Hassan et al., 2024).

4.3 User Experience and Operational KPIs

This system's installation greatly improves the overall transparency of an organization. Management can utilize real-time dashboard visualizations of raw operational data (pending versus approved applications) to create actionable KPIs that allow for better resource distribution and performance evaluations. End-users can submit forms and check the status of their applications remotely without having to go to a physical location, which greatly improves their customer experience. Ultimately, the IPMS model demonstrates how migrating manual processes to an integrated platform is a highly scalable digital transformation model and can close the gap between administrative oversight and operational accountability (Smith & Lee, 2023; Abdullah, 2024).

5. DISCUSSION

The Installment Plan Management System (IPMS) is a digital transformation of debt restructuring through the eradication of inefficiencies and high error rates of legacy paper-based processes. The automated calculations of financial figures, along with the establishment of fixed repayment terms for considered loans ensure elimination of computational errors through the adherence to policies established by organizations. The incorporation of Role-Based Access Control (RBAC) and real-time dashboard visualizations also contribute to transparency in operations, allowing management to convert raw data into actionable key performance indicators (KPIs), ultimately affecting the allocation of resources. With the successful fusion of administrative responsibility and operational accountability, and the improved end-user experience resulting from the ability to submit

and track applications remotely makes IPMS an extremely scalable alternative for modernizing organizational management service delivery (Ahmad, 2022; Hassan et al., 2024).

Table 1. Benchmarking

Feature	Manual Paper System (Current)	Generic ERP Module	Proposed IPMS
Submission Mode	Physical Form	Digital Input	Digital Input + File Upload
Approval Flow	Manual Routing	Sequential	Automated Workflow
Data Analytics	None (Manual Audit)	Standard Reports	Custom specific Dashboard
Security	Low (Physical Access)	Role-based Access	Encrypted Role-based Access
User Experience	Low (Tedious)	Medium (Generic)	High

6. CONCLUSION

To summarize, the Installment Payment Management System (IPMS) has fully accomplished its main goal of making and improving the workflow for all debt restructuring procedures (worldwide) in a modern way by taking a paper-based process and making it a secure, centralized, electronically based process. In addition, because of the use of electronic methods, the IPMS has improved data accuracy and the speed with which information can be processed due to the elimination of manual calculation errors, reductions in the number of administrative delay methods for processing accounts, and the continued acceptance of policy uniformity across all areas of operation of an organization. The utilization of real-time tracking and role-specific dashboards has allowed for greater visibility and accountability at the management level and has consequently improved the overall customer experience by allowing remote communication. Ultimately, the IPMS shows the true potential for commercialization based on its ability to provide a scalable method for using the same system as a foundation for future development and to confirm that automation and workflow systems like this will aid in modernizing efficiencies within organizations and optimizing resources while creating a foundation for continued growth of corporate management services.

References

- Bartlett, R., Morse, A., Stanton, R., & Wallace, N. (2019). *Consumer-lending discrimination in the FinTech era* (NBER Working Paper No. 25943). National Bureau of Economic Research. <https://doi.org/10.3386/w25943>
- Bertrand, M., & Morse, A. (2011). Information disclosure, cognitive biases, and payday borrowing. *The Journal of Finance*, 66(6), 1865–1893. <https://doi.org/10.1111/j.1540-6261.2011.01698.x>

- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30. <https://doi.org/10.1080/07421222.2003.11045748>
- Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2012). A decade of agile methodologies: Towards explaining agile software development. *Journal of Systems and Software*, 85(6), 1213–1221. <https://doi.org/10.1016/j.jss.2012.02.033>
- Gabor, D., & Brooks, S. (2017). The digital revolution in financial inclusion: International development in the fintech era. *New Political Economy*, 22(4), 423–436. <https://doi.org/10.1080/13563467.2017.1259298>
- Hershfield, H. E., Goldstein, D. G., Sharpe, W. F., Fox, J., Yeykelis, L., Carstensen, L. L., & Bailenson, J. N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research*, 48(SPL), S23–S37. <https://doi.org/10.1509/jmkr.48.SPL.S23>
- Leff, A., & Rayfield, J. T. (2001). Web-application development using the Model/View/Controller design pattern. In *Proceedings of the Fifth IEEE International Enterprise Distributed Object Computing Conference* (pp. 118–127). IEEE. <https://doi.org/10.1109/EDOC.2001.950428>
- Prelec, D., & Loewenstein, G. (1998). The red and the black: Mental accounting of savings and debt. *Marketing Science*, 17(1), 4–28. <https://doi.org/10.1287/mksc.17.1.4>
- Shao, Z., Zhang, L., Li, X., & Guo, Y. (2019). Antecedents of trust and continuance intention in mobile payment platforms: The moderating effect of gender. *Electronic Commerce Research and Applications*, 33, 100823. <https://doi.org/10.1016/j.elerap.2018.100823>
- Woolard Review. (2021). *The Woolard Review – A review of change and innovation in the unsecured credit market*. Financial Conduct Authority (FCA). <https://www.fca.org.uk/publication/corporate/woolard-review-report.pdf>