Volume 2, Issue 2

Innovation Series Quarterly

https://journal.academicapress.org/aps/index.php/isq

Research Article

Teaching and Learning Innovation in Management of Technology and Innovation: ThinQ

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Keywords:
Rent-to-Own (RTO)
Repayment Performance
Digital Payment Monitoring
IoT Integration
LG PayTrack

Abstract: *LG PayTrack is a digital repayment management solution designed to address repayment challenges in Malaysia's Rent-to-Own (RTO) market, particularly at LG Electronics Malaysia's Kelantan branch. The system integrates with the LG ThinQ IoT ecosystem to provide real-time installment tracking, automatic reminders, digital invoices, and multi-platform payment features, even in areas with limited internet coverage. The innovation aims to improve repayment discipline, customer awareness, and operational monitoring while reducing default rates and increasing efficiency. By combining IoT technology with proactive financial management, LG PayTrack supports sustainable RTO business models and aligns with Sustainable Development Goals (SDGs) related to responsible consumption, digital innovation, and financial accessibility.*

1. INTRODUCTION

The transformation of digital ecosystems has significantly changed how consumers' decisions, and perceiving of convenient and managed financial practice. Yet, Malaysia has recently been introduced to alternative financing methods such as interest-free instalment plans, Buy Now Pay Later (BNPL) programs, and Rent to Own (RTO) schemes. These methods have shown significant growth and are gaining popularity as consumers are more inclined to opt for flexible payment options. With this financing method, consumers can enjoy high-quality goods such as home appliances and electronic goods immediately, while making payments in instalments over a longer period.

However, repayment performance remains a crucial aspect in the success of RTO schemes. Despite the financial flexibility offered by the RTO scheme, many customers will face challenges in maintaining consistent obligation payments over a time period. Factors such as demographic, geographical area, household income, loan size and financial literacy are often significant to repayment performance. Poor repayment performance can trigger product repossession, increased default rates, and business operational losses for the provider. Thus, understanding and enhancing repayment performance is important to ensure the continued success and sustainability of the RTO scheme. LG Electronics firm that operating at economic scale, those issues expand beyond credit risk and structure limitation in existing repayment monitoring and engagement system. Internal sale report has illustrated recurring instances of not fulfilling repayment obligations that need to move proactive actions especially on the digital sector for strengthening repayment management.

2. LITERATURE REVIEW

In recent years, the adoption of RTO models has surged, particularly for everyday items, reflecting their growing applicability across various sectors. However, this model is not without risks, as non-compliance with repayment obligations can pose challenges (LG PuriCare Sales Order Form, 2022).

The introduction of RTO schemes provides multiple benefits such as relieving the financial burden on customers by allowing them to deferred payment, boosting purchase power for low-to-middle-income group and supporting ownership of premium products that would otherwise be unaffordable. Despite the benefits, these schemes also have challenges, such as increased risk of loan default due to longer repayment periods, lack of financial discipline for certain consumer groups and greater exposure to credit risk for business wise when screening for the customer is weak.

Emerging countries like Malaysia with emerging markets particularly within the Rent-To-Own (RTO) segment, both financial discipline and financial engagement still remain critical issues. LG Electronics Malaysia has faced spiking of instalment default, weak monitoring engagement and limited behavioural insight that has been directly influenced by the set of operational sustainability and customer truths worthiness.

Yet, LG's Kelantan is among the key RTO markets and has recorded 496 default cases yearly (2020 until 2023) which is third highest default rate among nationwide. The deteriorated occasion reveals deeper behavioural and technology limitations such as: lack of engagement to track repayment obligations, existing application does not provide transparency and low rate of broadband coverage in Kelantan increase inefficiency of current digital tools such as LG ThinQ that depend on 2.4Ghz WiFi connectivity.

The instalment payment performance on Rent-to-Own (RTO) consumers in Kelantan has recorded a total failure rate of 490 users recorded throughout 2023, In comparison, Kelantan is the branch with the third highest number of payment failure cases compared to all LG Electronics hubs in Malaysia. This situation reflects an unhealthy business environment in the long term. The total number of instalment payment failure cases in the Kelantan Branch recorded 18.6% compared to other branches in Malaysia. This percentage shows that customers in Kelantan failed to make payments as expected. Although Malaysia is facing high RTO product demand, LG experiences persistent repayment bottleneck based on behavioural, technological, and operational gaps.

The concentration of Rent-to-Own (RTO) applications at certain loan sizes, particularly at the RM7200 loan size, has raised concerns about the suitability of the loan structure with the repayment capacity of the customers. This size alone, there is a potential mismatch between the financial capability of the customers and the loan amount offered, especially if defaults are also high in this group. This disproportionate distribution suggests that customers may be attracted to the price of a particular product or loan scheme without fully considering their financial readiness, thus increasing the risk of default.

LG ThinQ application was introduced by LG in 2018 as a digital platform that is designed to support smart home functionalities rather than financial engagement and repayment management. The weakness of this application is lack of functionality of real-time payment transparency, proactive instalment reminder, AI-driven risk management and behavioural tracking abilities. The lack of integrating digital repayment systems limits customer’s awareness of upcoming payment obligations thereby increasing the possibility of unintentional delays, missed payments and ultimately default. The gap highlighted needs to be fulfilled with digital solutions to improve finance engagement and repayment discipline.

Fragmentation of operational monitoring among branches is one of critical issues with every branch nationwide operating in relying on manual and soloed tracking systems. This results in slow down of follow up and inaccurate data that significantly reduce the ability of branch and headquarters to intervene at an early stage of possible repayment issues. The lack of integration repayment ecosystem further weakens between LG Malaysia headquarter and branch operations, limiting effective oversight, decision making and holistically repayment performance management.

A high proportion of new customers installed without LG ThinQ adoption as a notable issue of digital engagement in Kelantan Branch. Based on the internal report between August and November 2025, the percentage of new customers installed without connection LG ThinQ consistently high ranging 86 percent to 93 percent, illustrating that the among new customers are not intergenerational with LG’s digital ecosystem. This lack of adoption limits the branch ability to deliver repayment reminders, monitor customer behaviour and implement proactive repayment strategies. Therefore, the low usage of LG ThinQ usage among new customers interferes with digital monitoring effectiveness and worsen repayment management challenges, especially branch level.

Infrastructure barriers especially in rural areas show significant challenges to effective repayment management specifically in the East Coast region of Malaysia. According to MCMC (2024), only 70 percent of Malaysian households have fixed broadband; coverage is lower in rural areas. This gap constrains customers' ability to sustain on online connectivity, making LG ThinQ compulsory to connect with 2.4GHz WiFi only. As a result, repayment reminders, notifications and digital engagement features become unaffordable or inaccessible for many rural customers, undermining timely payment behavior and effectiveness of digital-based repayment monitoring and intervention strategies.

3. METHODOLOGY

LG PayTrack is a proposed digital repayment management feature that is designed to be an integrated feature into the existing LG ThinQ application. Currently, LG ThinQ mainly focuses on controlling smart appliances and monitoring device performance. However, it does not provide any support for managing Rent-to-Own (RTO) instalment payments. For that, LG PayTrack was introduced to fill this gap by offering customers a clear and simple way to track their repayment obligations.

The main purpose of LG PayTrack is to improve the repayment performance of RTO customers by increasing payment awareness and transparency. LG’s data shows that some customers are not aware of their payment deadlines. The data also indicates that younger female customers represent the group with the highest number of missed payments. Through this feature, LG aims to improve the performance and management of LG ThinQ by providing customers with an easier way to view their instalment status, upcoming payment dates, and payment history within a single integrated platform. At the same time, LG can monitor repayment behaviour more effectively and take early action when potential payment issues arise in the future.

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Moreover, LG PayTrack is developed based on the challenges faced by LG Electronics Malaysia, especially in Kelantan, where default rates are high and existing monitoring systems are fragmented. Traditional collection methods are mostly passive and rely too much on manual follow-ups, which are time consuming and inefficient. In view of that fact, LG PayTrack introduces a more proactive approach by sending reminders and providing real-time payment information to customers.

In addition, LG PayTrack is designed to work in environments with limited internet connectivity, making it suitable for rural areas such as at Kelantan. By combining smart appliance management and repayment tracking in one integrated application, LG PayTrack helps customers better understand their financial commitments while supporting LG's long term business sustainability.

Figure 1. Proposed system architecture (PayTrack+LG ThinQ).

This section proposes the system architecture to support real-time repayment monitoring and customer engagement within the integration of existing LG ThinQ platform and LG's internal system. First and foremost, architecture starts at Branch level or Dealer level where the beginning of customer transaction, contract and sale information are gained from the Point-of-Sale (POS) system and Customer Relationship Management (CRM). Those records or data will be stored in a centralized contract database which contains important information such as model, serial number, customer details, financial information, loan size and contract period.

The second stage is a financial intelligence layer and the contract database will synchronize with the PayTrack server. This server functionality to analyze customer repayment behavior, identify payment real time status and extract customer risk profile information and payment performance. Next, synchronisation with API-base, PayTrack server connects with the LG ThinQ Cloud platform to protect linkage between customer accounts, registered devices and financial contract.

When a device is registered via the ThinQ ecosystem, customers can leverage repayment related information through LG ThinQ the mobile application interface. The new financial application interface such as monthly payment status (paid,due or overdue) next billing, contract summary, contract duration insight and payment scores. Moreover, automated notification will be delivered to enhance customer's payment awareness and mitigate unintentional defaults.

Customer' payment transactions proceed at the integrated Payment Gateway stage, which confirms complete payment and directly updates the system in real time. This successful transaction will be reflected directly within both the PayTrack server and ThinQ application with securing data consistently across applications ecosystem. Holistically, this new invention is an integrated architecture supposedly to strengthen transparency, enhance customer engagement and proactive application integration with repayment management compared to traditional manual and fragmented collection systems that have been key weaknesses.

4. FINDINGS

4.1. Functional Specifications of Product Innovation

LG PayTrack is designed as a new digital repayment management solution feature that integrates with the existing LG ThinQ application in order to help Rent-to-Own (RTO) customers in managing their installment payments more effectively. The system serves as a centralized platform for repayment, enabling users to easily and transparently view their payment status, installment history and also the upcoming due date to pay. On the newly redesigned homepage as Figure 5, users can immediately view all their RTO products linked to their account, along with a clear-color coded indicator showing that either the payments are completed, late or overdue as Figure 6. This will eliminate the need for manual tracking and enable customers to understand their financial situation quickly and better.

Furthermore, LG PayTrack offers a detailed payment history and installment tracking that allows users to review monthly transactions linked directly to their appliances such as product number, color and payment details. These features allow customers to monitor their payment progress and reduce confusion regarding outstanding balances, The features also have an automated notification and reminder feature that notifies and reminds customers and also sends alerts to customers before payment due dates, overdue payments and confirms successful payment. This feature helped reduce the main issue faced by LG Electronics by reducing missed payment caused by forgetfulness or lack of awareness.

Each RTO product is also supported by a specific financial insight page that displays the current payment status, monthly installment amount and the overall progress of the contract, such as how many months have been completed out of the total repayment period as Figure 2. Additionally, customers can also access billing history and a prominent "Pay Now" button that allows customers to instantly make payments. Furthermore, LG PayTrack generates digital invoices with customer information, product details, billing periods, installment amounts and payment terms. This will improve transparency and strengthen trust between LG and its customers as per shown in Figure 7.

To ensure ease of payment, LG PayTrack integrates with several local payment methods, such as credit and debit cards, FPX online banking, e-wallets, and Buy Now Pay Later (BNPL) services. The system is also optimized for low-connectivity environments, it can be used and suitable in even rural areas where stable internet access may be limited. Overall, LG PayTrack is a successful product innovation for enhancing RTO repayment performance and operational efficiency because it combines financial transparency with proactive reminders, and user convenience into a single platform.

4.2. Details of the Product Innovation

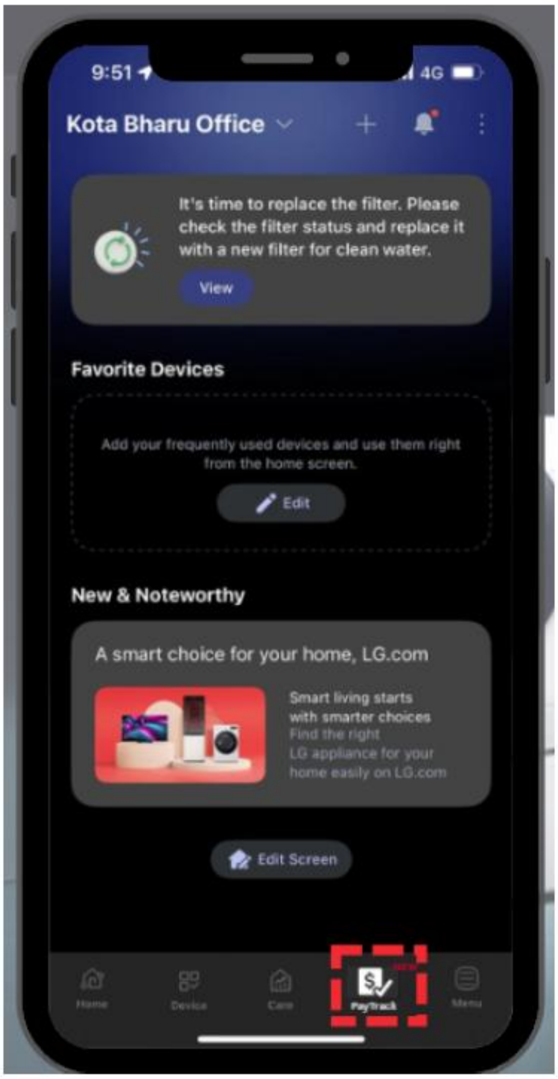

Figure 2. The product.

Figure 2 shows how LG PayTrack is visually integrated into the existing LG ThinQ application to support the repayment management for Rent-to-Own (RTO) customers. The redesigned interface shows the addition of a new PayTrack at the bottom of the application, making it easily accessible for the users. This visual change highlights how payment tracking is positioned as a core function alongside appliance control, rather than being treated as a separate or secondary feature.

Figure 3. The product.

On the other hand, the PayTrack main screen as Figure 3 displays a clear summary of payment information, including monthly installment amounts, products model, repayment status and next payment date. Color-coded indicators such as red for overdue, amber for late and green for completed payments allows users to quickly understand their payment condition at a glance. In order to keep users informed even when they are not actively using the application, Figure 3 also demonstrates how payment reminders and notifications appear directly on the user's mobile device. To keep users informed when they have new notifications or reminders. These reminders guide users to take immediate action by linking directly to the payment page.

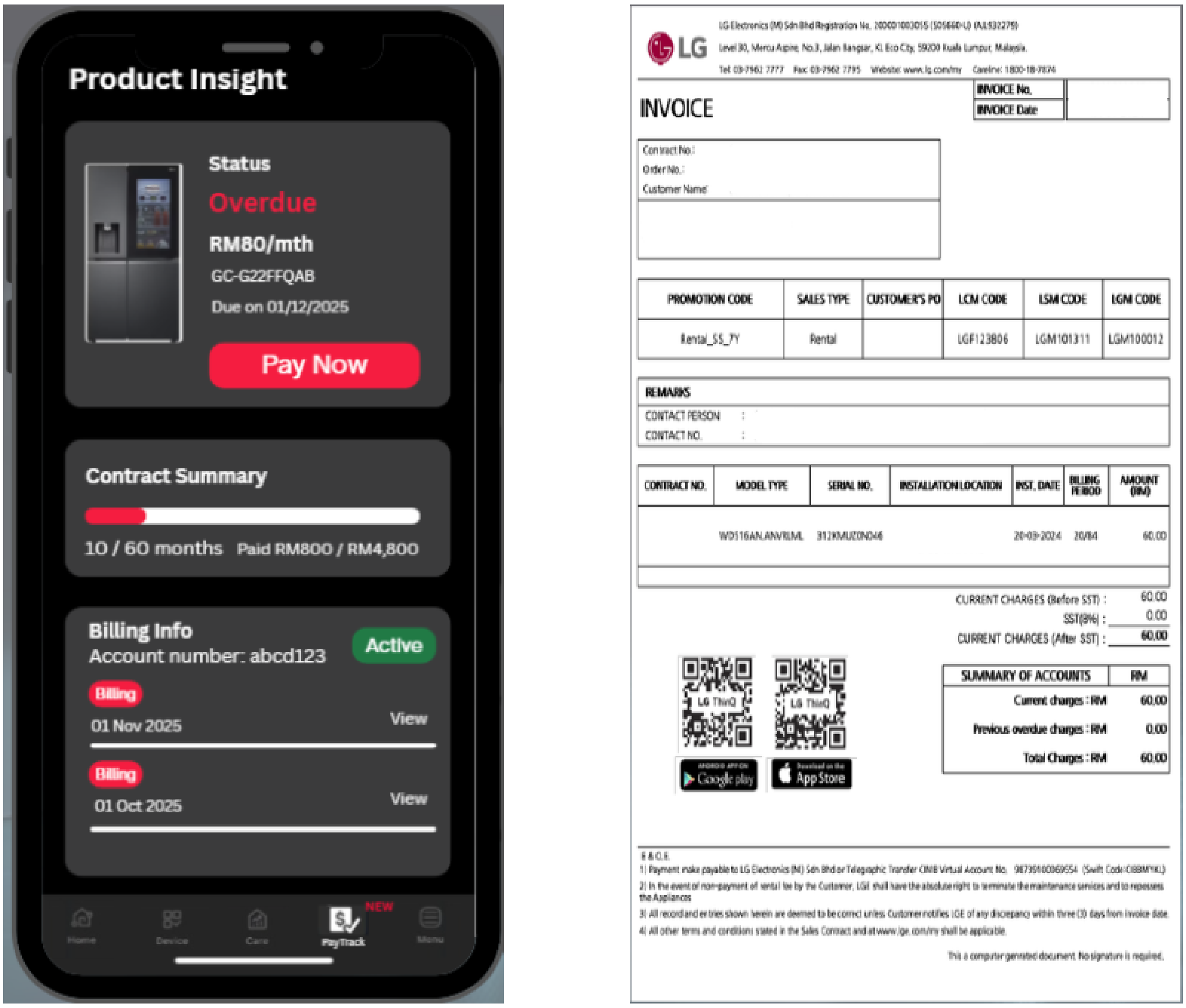

Figure 4. The system working.

Besides, Figure 4 shows the product-specific financial insight page, where users can view detailed repayment progress, billing history, and contract timelines for each appliance. The visual presentation helps users clearly connect their financial obligations to the actual product they are using and clearly shows progress toward the total. The invoice displays as per shown in Figure 9 further enhances transparency by presenting official billing information in a structured and easy-to-read format. Lastly, the payment gateway images demonstrate the availability of multiple payment options, ensuring convenience and flexibility for users.

Overall, the pictures of the LG PayTrack innovation product visually reinforce the system's main objectives, which are transparency, ease of use, and proactive repayment management. By presenting financial information in a clear and user-friendly manner, the interface supports better repayment behaviour and improves the overall customer experience.

5. DISCUSSION

5.1. Novelty and Uniqueness of Product Innovation

The core novelty of LG PayTrack is its integration of financial management functions with the function IoT-enabled appliance control. Unlike conventional payment reminder systems, the platform allows the users to simultaneously monitor the appliance usage, control smart features, and track instalment obligations within one application. This convergence creates a new user experience that combines product usage directly with financial responsibility.

LG PayTrack adopts a proactive design approach rather than a reactive one. Automated reminders are issued several days before payment due dates, enabling users to plan and manage repayments in advance. This feature reduces the likelihood of missed payments and shifts user behaviour toward preventive financial management, which is critical in RTO arrangements.

The platform is suitable with the Malaysian market environments, particularly in regions with inconsistent internet connectivity such as Kelantan. LG PayTrack is designed to optimize its function effectively under low-bandwidth environments. This is to ensure usability in semi-urban and rural areas. Besides, the user interface is designed to be intuitive and accessible across varying levels of digital literacy.

LG PayTrack can directly address the root causes of RTO defaults. It was identified from poor repayment visibility and lack of timely reminders. To cater to this issue, the system clearly communicates with showing the outstanding balances, due dates, and repayment status. This is to reduce the uncertainty and financial stress among users. Additionally, early reminders further support timely repayments and improve overall portfolio performance. By correlating appliance usage data with payment information, LG PayTrack enhances perceived value and fairness. Users are able to assess how their actual appliance usage relates to the cost of ownership, reinforcing the rationale for consistent repayment and promoting responsible consumption.

Transparency in repayment monitoring strengthens consumer trust in LG as a responsible and customer-centric brand. Rather than relying on punitive enforcement mechanisms, the platform positions LG as a supportive long-term partner, which contributes to higher customer satisfaction and loyalty.

5.2. Benefits to Mankind

LG PayTrack provides significant benefits to both consumers and organizations by improving the overall Rent-to-Own (RTO) payment experience. For consumers, the system offers greater clarity through timely updates on outstanding balances and payment schedules, helping users better manage their financial commitments. Early reminders reduce the risk of missed payments, penalties, and defaults, while transparent repayment tracking increases users' confidence in utilizing smart appliance features. In addition, LG PayTrack enhances convenience by integrating appliance management and financial monitoring into a single digital platform, creating a smoother and more user-friendly experience.

From an organizational perspective, LG PayTrack helps LG Electronics and its strategic partners reduce default rates through proactive repayment monitoring and behavioral reminders. Increased user interaction with the platform also provides valuable consumer insights that can support data-driven decision-making and service improvements. Furthermore, transparent communication and proactive support strengthen customer trust and loyalty, encouraging long-term relationships with the brand. The system also creates additional revenue opportunities through the promotion of maintenance services, extended warranties, and other digital value-added services.

5.3. Potential of Commercialization

The proposed system aligns with several prevailing market trends, including the rising adoption of smart-home technologies, increasing appliance prices, and growing consumer preference for flexible financing models such as instalment payments and RTO schemes. LG PayTrack presents opportunities for integration with telecommunications providers such as CelcomDigi and Maxis.

Bundling RTO appliances with broadband or mobile data subscriptions can enhance value propositions for consumers while accelerating smart-home adoption.

Beyond household consumers, LG PayTrack can be extended to small and medium-sized enterprises (SMEs). Bulk financing arrangements for commercial appliances (e.g., cafés, laundromats, and retail outlets) position LG as a strategic business partner rather than a standalone equipment supplier, thereby strengthening B2B market penetration. LG PayTrack promotes responsible financial behaviour through its automated reminders and transparent repayment monitoring. It aims to reduce the default rates and contribute to healthier financial performance for branches and partners. This will support a sustainable consumer financing ecosystem.

The platform is built based on a data-driven repayment monitoring infrastructure. It will enable the application of advanced analytics, including AI-based risk scoring. This innovation will expand LG's role from appliance manufacturing into digital financial solutions. By encouraging timely repayments and reducing repossessions, LG PayTrack minimises product waste and improves appliance lifecycle sustainability. The system supports responsible ownership and usage patterns.

LG PayTrack facilitates collaboration among headquarters, branches, finance units, and technology teams. It also enables partnerships with banks, e-wallet providers, telecommunications companies, and fintech firms, to build an inclusive digital financing ecosystem.

6. CONCLUSION

In conclusion, LG PayTrack offers a valuable opportunity for LG Electronics to improve its segment in Rent-to-Own (RTO) scheme while enhancing the overall customer experience. The invention is to focus on the aspect of integrating repayment tracking into the existing LG ThinQ application. Consequently, customers are provided with clearer payment information, timely reminders, and easier access to their financial commitments. This will reduce the confusion, missed payments, and unnecessary stress for users.

At the same time, the system will also create better business opportunities for LG. It is by strengthening the customer engagement, improving repayment performance, and building long-term trust. It will be able to support a more transparent and customer-centric approach, which will improve the company positioning as a responsible and innovative brand. Overall, LG PayTrack offers a practical solution that will benefit both customers and the company, while supporting sustainable growth and improved service quality.

Acknowledgments: We express our sincere gratitude to everyone who contributed to the successful completion of project innovation especially lecturers, team members, friends, and family for their cooperation, encouragement, prayers, and unwavering support.

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