

Implementation of Kanban Method in Transactional System Design in the “Mr. Sneakers” Shoe Laundry Business

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ABSTRACT

In the fast-growing laundry business, efficient transaction management is crucial for success. Proper information system implementation can speed up processes, improve accuracy, and enhance customer experience. However, the shoe laundry business faces challenges due to the large number of services and increasing consumer numbers. To meet these needs, a computer-based transaction system is needed, which requires further training for employees to adapt to the computerized system accurately. One effective methodology for improving operational efficiency and transaction management is the Kanban system. Kanban, derived from Lean manufacturing practices, has been successfully adopted in various contexts, including information systems. It focuses on visualizing workflows and inventory management wisely, enabling teams to effectively manage tasks and ensure timely completion. In the context of the laundry business transaction information system, Kanban can bring significant benefits. Using digital Kanban boards or an integrated task management system, the laundry business can track every step of the transaction process, from receiving orders to returning them to customers. This allows administrators to easily monitor the status of each order, identify bottlenecks, and respond quickly to changes. Kanban also promotes better team-to-team collaboration and open communication. In this research will discuss the implementation of Kanban in the shoes laundry business transaction information system, including practical steps to apply this concept in the context of information technology. By adopting this approach, laundry can improve operational efficiency, increase customer satisfaction, and gain a competitive advantage in an increasingly competitive market.

INTRODUCTION

A dynamic and fast-growing laundry business, efficient transaction management is the key to success. Proper information system implementation can speed up processes, improve accuracy, and improve the overall customer experience. One of the obstacles experienced in the shoe laundry business requires complex handling given the large number of services as the number of consumers increases. In order to meet the needs of existing business processes, a computer-based transaction system is needed to interfere with existing processes so that the efficiency and effectiveness of the enterprise can be realized, further training is also needed because of the transition of the manual system to a computer-based system so that employees can adapt in using the computerized system accurately targeted.

One methodology that has proven to be effective in improving operational efficiency and transaction management is the Kanban system. Kanban is a concept derived from Lean manufacturing practices, this method has been successfully adopted in a variety of contexts, including in information systems. Kanban focuses on visualizing workflows and inventory management wisely; Kanban enables teams to effectively manage tasks and ensure that tasks are completed on time and according to customer needs. In the context of the laundry business transaction information system, the application of Kanban can bring significant benefits. Using digital Kanban boards or an integrated task management system, the laundry business can track every step of the transaction process, from receiving orders to returning them to customers. This allows administrators to easily monitor the status of each order, identify bottleneck, and respond quickly to possible changes.

In addition, Kanban promotes better team-to-team collaboration and more open communication. Clear visualization of workflows and priorities allows each team member to easily see tasks to be completed, know the status of orders, and contribute to overall operational success.

In this exhibition, we will discuss in detail the implementation of Kanban in the laundry business transaction information system, including practical steps to apply this concept in the context of information technology. By adopting this approach, laundry can improve their operational efficiency, increase customer satisfaction, and gain a



competitive advantage in an increasingly competitive market.

LITERATURE REVIEW

Kanban is one of the most popular Agile project management frameworks. Kanban's methodology takes a visual approach to project management that is intuitive and exciting. In addition, its emphasis on delivery can help the team improve efficiency and improve overall output (Leffingwell, 2016).

Taiichi Ohno, a Japanese engineer at Toyota, developed Kanban in the late 1940s. Ohno recognized that he could enhance the Toyota Production System by integrating aspects of lean manufacturing. Rather than producing new products based on predicted demand, Ohno's Kanban framework—also known as the "Just-in-Time" (JIT) system—focused on manufacturing and replenishing products in response to consumer demand. The new framework transformed Toyota's manufacturing process from a "push" approach, where products are pushed into the market, to a "pull" approach, where products are created based on market demand. This change allowed Toyota to maintain lower inventory levels while remaining competitive in the market. Although Kanban is still widely used in various manufacturing environments, it was adapted for software development in the early 2000s. Kanban for software development employs the same "pull system" process that Ohno's lean manufacturing utilized (Martins, 2024).

The six core practices of Kanban methodology are as follows (Leffingwell, 2016):

1. Visualize workflow. Kanban requires the use of physical or virtual boards to visualize how workflow from one stage to the next. Kanban requires the use of physical or virtual boards to visualize the workflow as it progresses from one stage to the next. These boards typically feature columns representing different stages of the process, such as "To Do," "In Progress," and "Done." By moving tasks through these columns, teams can easily track the status of each task and identify bottlenecks in the workflow. This visualization technique helps teams to manage their work more efficiently, improve communication, and enhance productivity. The use of Kanban boards has become widespread in various industries, including manufacturing, software development, and project management, due to its simplicity and effectiveness in optimizing workflow. (Anderson, 2010)
2. Limit ongoing work. Each project team needs to set a limit on how many tasks are allowed in each workflow phase at once. If there are five reviewers, limit the "Review" phase to no more than five tasks at a time. This approach, known as Work In Progress (WIP) limits, helps prevent bottlenecks and ensures that tasks are completed efficiently without overburdening team members. By implementing WIP limits, teams can maintain a smooth workflow, improve focus, and enhance overall productivity (Kniberg, 2010).
3. Manage workflow actively. As a project manager, his primary role is to monitor workflows to find barriers and make adjustments to remove barriers to improve efficiency. By actively managing workflows, project managers can ensure that tasks progress smoothly, address any issues promptly, allocate resources effectively, and keep the project on track towards successful completion. This proactive approach helps to streamline processes, enhance collaboration among team members, and ultimately deliver better results (Schwalbe, 2020).
4. Create a process guideline. Have clearly communicated guidelines about how work is completed, what "finished" means, etc. It could be a checklist in each column or in each "card" that outlines what is needed to proceed to each stage.
5. Use feedback loop. To implement a feedback loop effectively, utilize tools and processes that facilitate early and continuous feedback. This can involve incorporating multiple stages of review, employing reports and metrics to communicate performance, and establishing mechanisms for gathering input from stakeholders throughout the project lifecycle (Schwalbe, 2020).
6. Evolve. Like other Agile frameworks adapting, developing, and improving processes is highly recommended. Focus on developing and implementing small changes to improve workflows and processes.

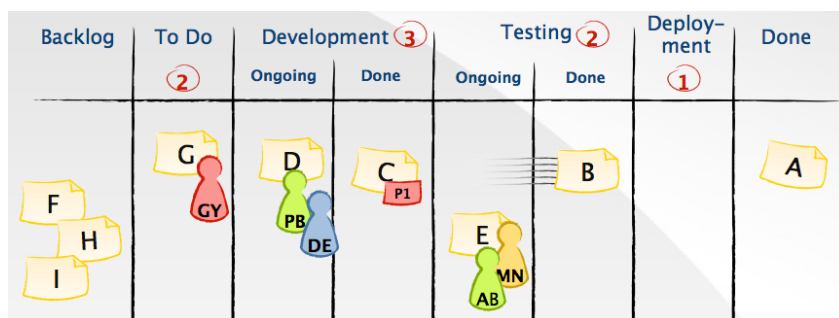


Figure 1. Kanban Board (14)

There are several advantages of using Kanban in software engineering, such as: Visual Workflow Management, Flexible Prioritization, Efficient Resource Utilization, and Continuous Improvement. These advantages contribute to

increased productivity, faster delivery, and better alignment with customer needs in software development projects using Kanban (Oshana, 2019).

Previous research has used a lot of Kanban as frameworks. Kanban methodology is used for a wide range of application designs, i.e. to minimize delays in system laundry (Yulia, 2016), agricultural e-commerce applications (Dicky, at all, 2020), labor intensive company (Novera, 2019), software development (Magdalena, 2016), Telecom Product Maintenance (Marko, 2011), and so on. It can be understood that Kanban's methodology can and is suitable for use in software development. (Bolaji, 2015).

METHOD

Research method.

Research method is a way or technique to collect or obtain data, whether it is primary or secondary data commonly used in the purpose of making scientific work or research purposes and to then analyze factors related to the substance of the problem in order to obtain a truth of the information obtained.

Data Collection Method.

In this research the primary data source obtaining is done by doing direct observations or observations in Mr. Sneakers Laundry as well as conducting interviews with the official of Mr. Sneakers laundry while the secondary information is obtained from the documents provided by Mr. Sneakers Laundry

System Approach.

In the understanding of problems, a system approach is carried out which contains a series of measures to solve problems so that solutions or alternatives can be found. System approach method is solving a one-way problem that begins against a need with identification and existing problems. With this design, all the processes that are carried out can be organized and directed. Development methods are a set of activities that have been structured into several stages to help the writer in the development of the system.

System Development Methods.

System development methods can mean designing a new system to replace an existing system as a whole or repairing an old system

System Testing Methods.

Software testing methods will be improved using the Black Box method. Black Box testing focuses on the functionality of the software created. Black box testing is testing software in terms of functional specifications without testing the design and code of the program.

Process Planning Using Use Case Diagram.

This use case diagram aims to describe in knowing the relationship that will occur between use case and actors in the system. Here's the use case diagram on the laundry service system.

RESULT

Business Process

The operational stages of the laundry "Mr. Sneakers" as seen at Figure 2.

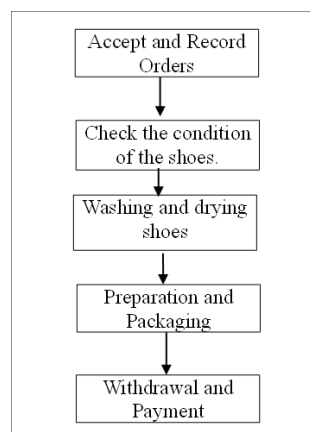


Figure 2. System Business Process Diagram.

As shown in Figure 2, there are 5 (five) business processes namely:

1. Accept and Record Orders, includes:
 - The customer comes and gives the shoe vs to be washed.
 - The officer receives shoes, performs preliminary inspection, and records the details of the order.
2. Check the condition of the shoes, includes:
 - Shoes are checked for stains or damage.
 - Detected nodes are removed before the washing process begins.
3. Washing and drying shoes, includes:
 - Shoes are washed using methods and cleaning materials that match the type of shoes and customer instructions.
 - Shoes are dried with a dryer or insulated manually, depending on the shoe type and needs.
4. Assembly and Packaging, includes:
 - Shoes assembled and packed for pickup by the customer.
5. Withdrawal and Payment, includes:
 - Customers come to pick up their shoes according to the agreed date.
 - Customer makes payment

Workflow Visualization

This sub-section describes the Kanban implementation diagram for the shoe laundry information system. This diagram reflects the integrated workflow between the information system and Kanban boards in the “Mr. Sneakers” shoe-laundry business. Each stage in the process is represented by a column on a Kanban board, which allows the team to track and manage orders more efficiently.

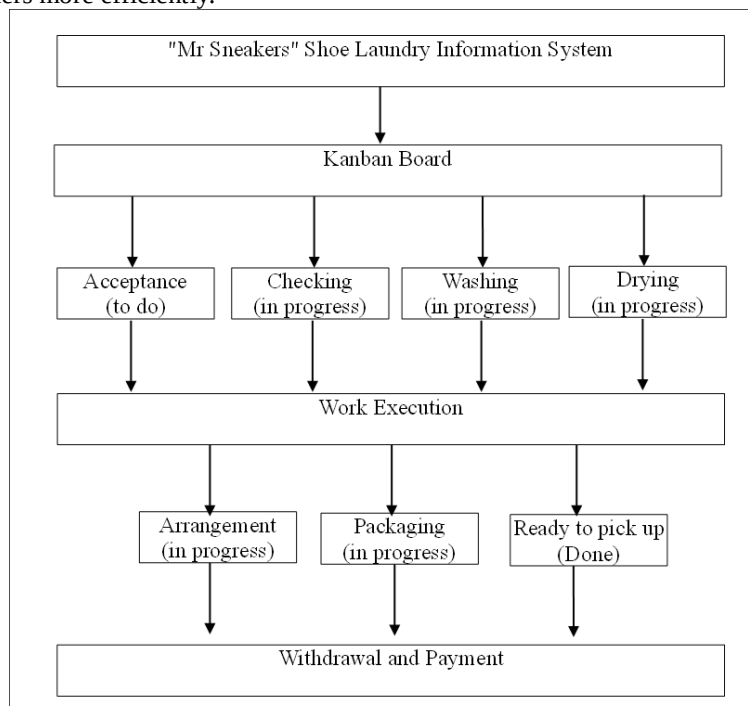


Figure 3. Kanban Implementation Diagram for Shoe Laundry Information System

Description:

1. Kanban Board: Integrated with the information system, this Kanban board provides visualization of the shoe order workflow.
2. Acceptance column (To-do): Shows orders received and waiting to be completed.
3. Checking column (In-progress): Shoes orders in the process of inspection and detailed recording.
4. Washing column (In-Progress): Shoe orders being washed.
5. Drying column (In Progress): Shoes order being dried.
6. Arrangement, and Packing column (In-Process): Shoe order being sorted, prepared, and packed.
7. Ready to pick up column (Done): Show orders of shoes that are finished and ready to be picked up by the customer.

DISCUSSION

System Modeling

After conducting an interview with the product owner, obtained the results of functional needs analysis for the laundry system with details as in Figure 3. Some of the main functions that will be implemented on this information system are transaction function, payment function and reporting function, in detail can be seen on Figure 4.



Figure 4. Mr. Sneakers laundry system context diagram

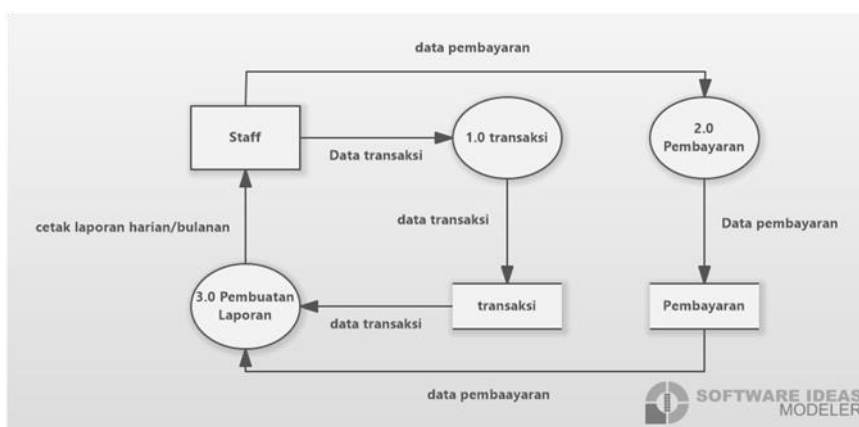


Figure 5. DFD Level 1

System design

The system design is structured on the basis of functional needs that have been analyzed so that results in a design as in Figure 6 to Figure 8.

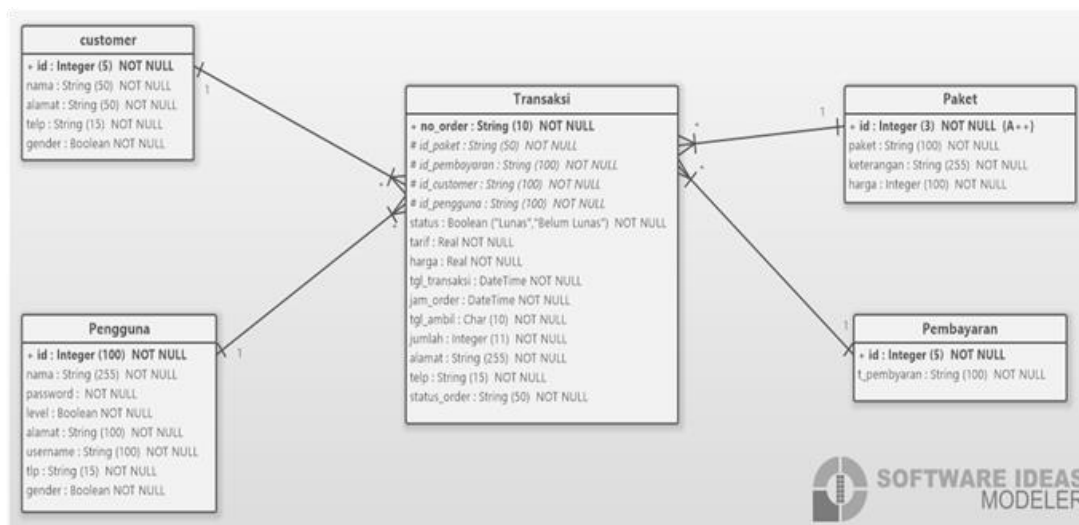


Figure 6. Database Design

Figure 6. describes the database design used on the "Mr. Sneaker" shoe laundry system. There are 5 (five) entities that are functionally interrelated.

No	Tgl. Transaksi	Pembayaran	Customer	Paket	Status Order	Total	Aksi
1	11/16/2023- 18:00:39	Belum Lunas	Iuqman	DEEP CLEANING +	Baru	Rp. 150.000,-	Detail
2	11/16/2023- 17:29:56	Lunas	dika	DEEP CLEANING	Baru	Rp. 120.000,-	Detail
3	09/02/2023- 10:15:56	Belum Lunas	dika	DEEP CLEANING +	Baru	Rp. 100.000,-	Detail
4	09/02/2023- 10:07:47	Lunas	wulan handayani	DEEP CLEANING	Diambil	Rp. 200.000,-	Detail

Figure 7. Transaction Menu

Figure 7 shows a transaction menu containing information about the order date, the selected execution package, the payment status, the execution status, up to the total payment. For the status of payment and execution can change according to the progress of execution and the payment made.

LAPORAN PEMASUKAN HARIAN Mr Sneakers Laundry
Bandung
Hp : 0899-7160-020
Website : mrsneakersbandung.blogspot.com

No	Tgl. Transaksi	Customer	Paket	Berat	Harga	Status Order	Total
ORD-000001	09/02/2023-10:07:47	wulan handayani	DEEP CLEANING	5 kg	Rp. 40000	Diambil	Rp. 200000
ORD-000004	09/02/2023-10:15:56	dika	DEEP CLEANING +	2 kg	Rp. 50000	Baru	Rp. 100000
ORD-000005	11/16/2023-17:29:56	dika	DEEP CLEANING	3 kg	Rp. 40000	Baru	Rp. 120000
ORD-000006	11/16/2023-18:00:39	Iuqman	DEEP CLEANING +	3 kg	Rp. 50000	Baru	Rp. 150000

Figure 8. Daily Income Report Display

Figure 8 shows the daily income report of Mr. Sneaker's Laundry Shoe. The report contains the package of work ordered, the status of work and the total incomes per day. On this system has not been made a recapitulation of monthly intake as requested by the owner of the laundry. In the future, a more complete shoe laundry system will be designed and implemented until cash flows system.

CONCLUSION

The conclusion of designing a shoe laundry information system using the Kanban method is as follows:

1. Kanban implementation allows for clear visualization of the workflow in the process of the shoe washing transaction.
2. Good integration between Kanban board and the existing information system is the key to the successful implementation of Kanban. This ensures that the information displayed on the kanban board is always accurate and up-to-date.
3. Designing a laundry information system by using Kanban can improve business performance, strengthen customer relationships, and create significant added value.

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