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Implementation of an Agile Receivables Management Model Using Kanban to Reduce Delinquency Rates in Digital Transformation Consultancies

Ximena Naomi Paredes-Chirinos
Bachelor in Industrial Engineering
Faculty of Engineering, Universidad de Lima, Peru
20161071@aloe.ulima.edu.pe

Nicolás Mateo Caballero-Carpio
Bachelor in Industrial Engineering
Faculty of Engineering, Universidad de Lima, Peru
ncaballero@bsf.cl

Juan Carlos Quiroz-Flores
Research Professor
Faculty of Engineering, Universidad de Lima, Peru
jcquiroz@ulima.edu.pe

Abstract

This study addresses the high delinquency rates and inefficient accounts receivable management in consulting firms. Using diagnostic tools such as Value Stream Mapping (VSM), problem tree analysis, and the Ishikawa diagram, critical factors affecting collections management were identified. An agile collections management model is proposed, involving process standardization and the implementation of a Kanban board, designed to be seamlessly integrated into daily company operations. The fundamental contribution of this work is the establishment of a clear and efficient workflow that significantly improves the collections process from the sale of the service to the effective collection of payments. This model was initially tested in a digital transformation consulting services company, where remarkable results were achieved. The outcomes demonstrated a 28% reduction in the delinquency rate due to the implementation of the proposed model. Other key performance indicators include a decrease in the average collection period, an increase in the proportion of clients making timely payments, and a reduction in the frequency of documentation errors. These results underscore the effectiveness of the proposed collections management model, providing a replicable framework for other firms in the sector.

Keywords
Delinquency, Kanban, Process Standardization, Collections Management, Consulting Services.

1. Introduction
The backbone of all companies is the financial area. It plays a fundamental role; therefore, the proper management of financial resources is crucial to ensure economic viability and proper business development. Within it, there are fundamental elements such as accounts receivable, which are part of the working capital. The effective management of accounts receivable increases working capital, which ultimately contributes to the organization's current assets (Rao & Gaglani, 2014).

In the business environment, companies could offer their customers the possibility of purchasing products and/or services on cash or credit. Credit sales can generate higher profits by increasing the volume of sales or services. However, poor collection management could lead to the accumulation of accounts receivable increasing the delinquency rate, or even companies could be exposed to potential losses due to the inability to settle outstanding receivables (Berliana, Wasti, & Elok, 2024).
There is no minimum or maximum level of delinquency to be managed by companies. However, companies should strive to maintain a low level of delinquency.

It is imperative to recognize that credit is extended when the trade sale is made, and that as longer payment terms are granted to customers, the return on working capital invested in accounts receivable becomes slower. This means that there is a lower accounts receivable turnover rate (Berliana, Wasti, & Elok, 2024).

On the one hand, Zimon & Zimon (2019) argue that it is of utmost importance to introduce an adequate accounts receivable management strategy that allows to control clients and avoid the occurrence of overdue accounts receivable. On the other hand, several authors.

On the other hand, several authors mention that poor management of a company's working capital could have serious consequences on the profitability and liquidity of a company (Louw, Hall, & Brümmer, 2016). Furthermore, in Salazar's research, he indicates that specialists agree that the consequences of a high level of delinquency are due to the existence of silos between the commercial department and collection management (Salazar, Córdova, Villanueva, & Merino, 2021).

1.1 Objectives
The objectives of this research are to identify and analyze the distinctive factors that lead to a high delinquency rate within service companies, and then propose improvement strategies using process standardization tools, policy implementation and a Kanban board through an analysis of existing processes and provide recommendations to improve collection management.

2. Literature Review
2.1 Standardization of processes
According to ISO, processes are a set of interrelated or interacting activities, transforming input elements into output elements. They serve to organize and structure activities within an organization to generate optimum efficiency and effectiveness. Standardization is defined as the degree to which work rules, policies and operating procedures are formalized and followed. Currently in the world there is a need to control processes based on a standard defined by companies. Therefore, there are national and international organizations whose purpose is to certify the quality in the execution of their processes to ensure customer satisfaction, this being one of its fundamental principles (Ungan, 2006).

Process documentation is an important tool to standardize a process. There is steps to follow to carry out process documentation: identify the process, identify the process masters, build a team, define the process and divide it into steps, acquire the knowledge for each step, code and verify, and finally combine and place a standard form (Ungan, 2006).

There is research focused on evaluating how the implementation of standardized management systems has influenced collections management. After evaluating organizations that had standardized processes and others that did not, it concluded that the implementation of a standardized quality management strategy will allow controlling processes from the commercial area to cash flow conversion, thus avoiding the emergence of overdue receivables (Zimon & Zimon, 2019).

2.2 Business Process Model and Notation
Process mapping is an analytical approach that seeks to understand the process by constructing a map involving personnel, activities, information and the objects involved. It is an economical tool, which can help improve and/or redesign a process (Biazzo, 2000). In addition, it complements process standardization by helping to understand the process in a visual way. Process mapping is a tool that can be used in both production and services. It allows to identify

the "As-Is" of the business processes in order to obtain the "To-Be" roadmap by means of reengineering tools (Hunt, 1996).

BPMN is a standard for business process modeling that provides graphical notation for specifying business processes using a business process diagram. BPMN is intended to show the representation of business processes for technicians and business users, providing a notation that is understandable for the latter and at the same time able to reflect the semantic complexity of the processes (Von Rosing, Scheer, & Von Scheel, 2015).

2.3 Kanban Board

According to Kanban University, the definition of Kanban is a Lean workflow management method to define, manage and improve services that deliver knowledge work. Kanban uses an evolutionary change approach, taking as its basis the current way of working, seeking to improve it using many forms of feedback and collaboration. This tool helps visualize work, maximize efficiency and continually improve. Kanban uses visual cards to represent various work items, allowing you to track their progress over time on a board. This clear and organized visualization of workflow facilitates more efficient management and provides an instant visual understanding of the task status (Alaidaros, Omar, & Romli, 2021).

The Kanban board is a visual representation of cards that represent the work items in a system. The objective of this is to improve efficiency, reduce costs and waiting times, and optimize processes. Both approaches complement each other to improve service quality and customer satisfaction (Kanban University).

2.4 Value Strue Mapping (VSM)

An investigation of VSM literature, determined that VSM is primarily used to improve productivity; however, in recent applications, the tool has been extended to other purposes such as improving leadership, benchmarking, and increasing value in the supply chain (Gurumurthy & Kodali, 2011).

Productivity has always been closely related to manufacturing. However, in services, the value chain can be very extensive and difficult to understand in traditional flowcharts or flowcharts.

When it comes to sitting down to review how management is adding value to the service, the VSM becomes the best complement as a tool. In the corporate world, companies make financial commitments to customers and suppliers. The best cycle for money will be to collect as soon as possible and pay as late as possible. But, if we get closer to reality, looking for balance, in the best trapeze artist style, becomes a task that cannot be left unchecked and unmanaged.

In definition, the VSM is a tool that serves as a compass for management, helping us to define where we are and where we are going. It also helps to be clear about all the actions, whether they add value or not, that are needed to deliver the product or service during its transformation (Quijada, 2019).

2.5 Company Policies

According to the RAE, policy is a set of guidelines or guidelines that govern the actions of a person or entity in a specific matter or field. In the business environment, policy should be considered as the basis that ensures uniformity in the daily activities of the organization and helps to establish a model of business conduct. It is made up of three components: objective, necessary resources and customers and their interests.

There are specific policies that focus on applying to certain processes such as: sales policy, purchasing policy, credit and collection policies, among others. What these policies will achieve is to ensure equitable treatment among employees, generate internal communication security at all levels, but above all they are a source of initial, quick and clear knowledge (Illera & Illera, 2015).

Explicit policies are an explicit description of the various arrangements that shape the operation of service delivery. Policies may reflect how work items move from one activity to another or may include how a team, individuals and services interact with each other (Kanban University).

In a 2018 study, it was determined that risk management and good control of the delinquent portfolio generate beneficial results that ensure profitability. As well as the implementation of credit policies will allow decreasing the

delinquency rate (Jimenez & Manrique, 2018).

3. Contribution

3.1 Fundamentals of the model

The proposed model is simple to implement and does not require significant expense. It also aims to achieve positive results in accounts receivable management, reducing the delinquency rate and achieving optimal cash flow. The methodology integrates tools such as the Value Stream Map (VSM), which allows the identification of process times, and the Business Process Model (BPM) to model the processes by making an As-Is and To-Be diagram that reflects the current situation and then compare it with the ideal process. To this end, the Systematic Interrogation Technique. To this end, the Systematic Interrogation Technique was used with the process participants, as well as tools such as the problem tree and the Ishikawa diagram to identify the main and secondary factors involved (Figure 1).

Three tools have emerged from the analysis that were used to develop the proposed model. Firstly, process mapping was carried out to analyze the current situation of how collection management is followed out, which is of great importance since it reveals that users are currently governed by the experience and day-to-day work and not by the existence of a standardized process. On the other hand, the departmental silo between the commercial and credit areas has caused delays in collections and inefficiency in customer service, so after standardizing processes, it is proposed to implement policies that involve both areas.

Finally, the lack of control indicators and inefficient portfolio segmentation leads to poor collection follow-up. So, the implementation of a Kanban Board will better visualize the work, limit the work in progress and maximize efficiency from start to finish. This method is used because it has gained popularity due to its flexibility and adaptability to information systems. The Kanban method allows development to be done iteratively and incrementally, focusing on team collaboration and rapid response to changing user needs (Anandya, Lestari, Hartanto, & Sukarmanto, 2023).

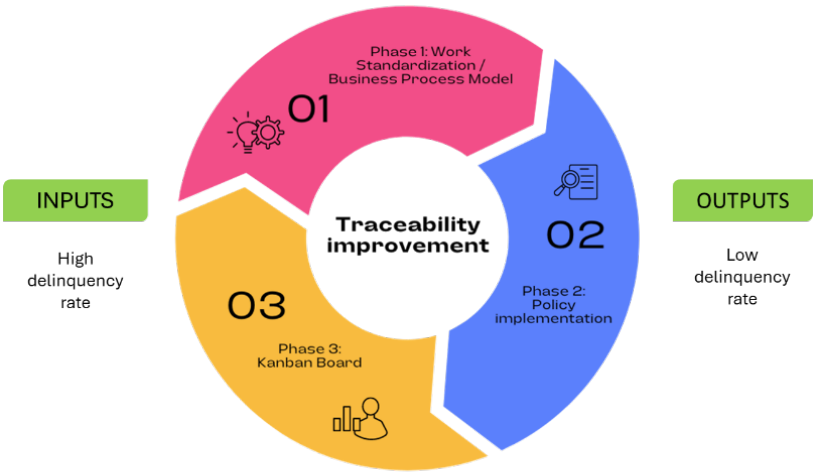

Figure 1. Proposed model

3.2 Proposed model

The proposed model consists of two components aimed at improving the collections process. The first component consists of the efficiency of processes, where initially the current existing processes will be reviewed, performing a process mapping reflected in an As-Is diagram in order to validate the existence of reprocesses and inconsistencies within the same; as well as with the help of the VSM the processes that add the most value will be identified and with the visual help of the macro process we can identify those that are not part of the core business and do not add significant value. After that, the appropriate processes will be designed to maintain a standard, which will be reflected

in a To-Be diagram. In addition, in order to maintain standards in the procedures, a credit and collections policy will be developed, in which the commercial and collections teams will be involved, disclosing the credit conditions that would be granted to the client and the follow-up that will be given to the collection. The policies to be implemented should cover aspects from the granting of credit to the recovery of the portfolio, which implies involving the commercial and collections areas (Gutiérrez, Peralta, & Milton, 2021).

Finally, to complement the model, the Kanban Board will be implemented to control the management of the collection process, order the tasks by each person responsible for the area and visualize the workflow according to the priorities of the portfolio and card segmentation implemented. The specific objective of this tool is to contribute to the collection fluidity and a faster cash flow. In other words, to increase accounts receivable turnover. In other words, to increase accounts receivable turnover.

This proposed management model will allow to have a visual control of the progress of the collection management and team tasks. The alerts are focused on avoiding delays in the activities; therefore, each card should have a standard time defined by the team for the execution of the activity. As complementary activities to the proposed management control, the collections and billing team will hold 2 monthly meetings to review the status of the management and define priorities for attention. The first meeting will be held on the second Thursday of each month, i.e. at the close of billing, and the billing status will be reviewed with the commercial team as a special guest. The second meeting will be the last week of the month with the objective of reviewing the status of collections according to the proposed indicators, where the commercial team will be invited, as well as the administration and finance management (Figure 2).

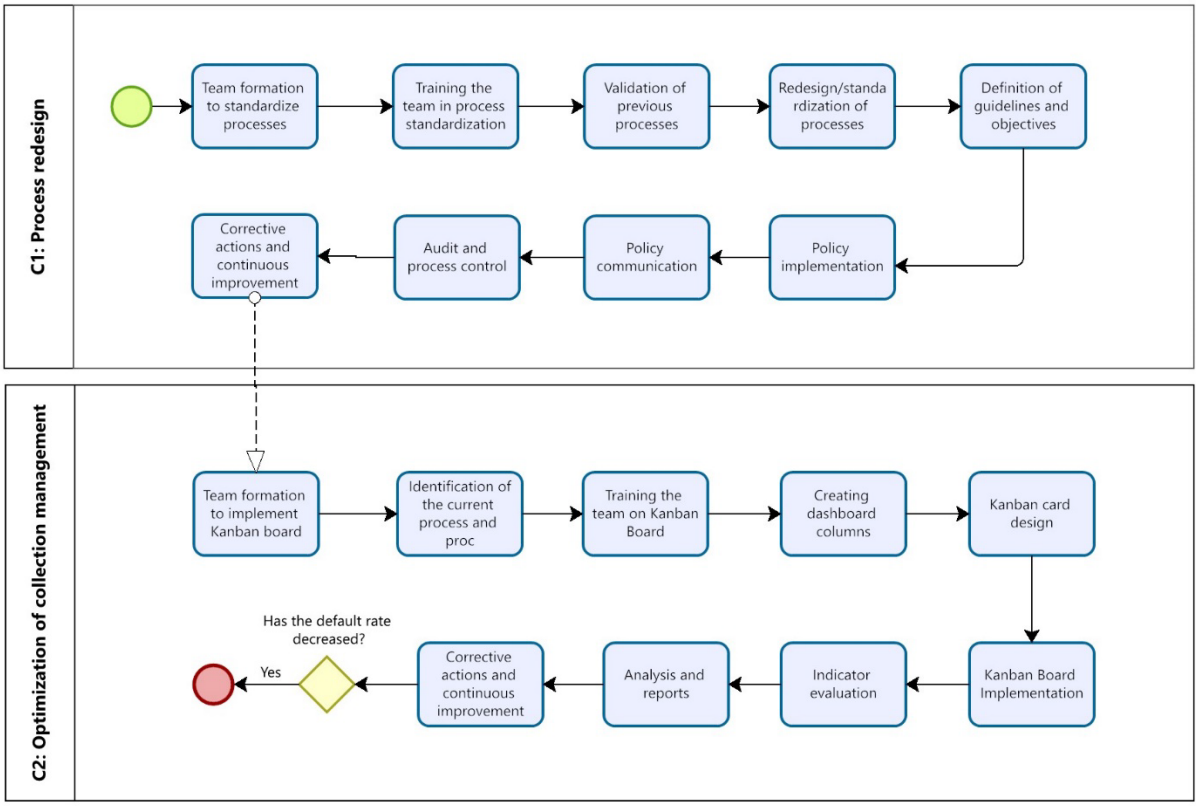

Figure 2. Implementation method of the proposed model

3.3 Model indicators

The analysis and evaluation of the improvements achieved can be identified through the following indicators:

$$Delinquency\ rate = \frac{Overdue\ accounts\ receivable}{Total\ accounts\ receivable} * 100$$

$$\%\ Prompt\ payment = \frac{Amount\ collected\ in\ advance}{Total\ accounts\ collected} * 100$$

$$Average\ collection\ period = \frac{Total\ accounts\ receivable}{Net\ sales} * 365$$

$$\%\ Document\ errors\ = \frac{Credit\ notes\ quantity}{Invoice\ quantity} * 100$$

4. Validation

4.1 Initial diagnosis

The case study was carried out in a service company. It develops its main activities in the world of IT consulting, where it has investigated opportunities for improvement in collection management through research and analysis.
In order to have a better diagnosis, interviews were conducted with personnel from the financial area. The first point to consider was that the VSM tool showed that the average waiting time for cash flow to be converted into cash is very long. In the initial diagnosis, it was found that the average collection time is 54 days. In other words, it takes almost 2 months for the money to return to the company after the service has been provided, which is directly affecting working capital.

During the conversation with the staff, questions were asked about the processes, both their management and supervision, finding that, despite having a quality system, they do not consider the procedure as a reference point for the execution of the processes during the day to day. Adding to the problem presented initially, the payment conditions are agreed by the client with the commercial area and do not involve the collection area.

There is little vertical communication with subordinates or users from other areas who participate in the process they are in charge of. In addition to this, the lack of records to ensure the correct execution of the process shows us that it is important to standardize the processes and generate the necessary control measures to ensure compliance and to be able to review backwards in time why it is not being complied with in case it is so. This has shown that, in the situation prior to the improvement, there is a delinquency rate of 48%, resulting in almost half of the total accounts receivable belonging to the past-due portfolio.

The proposed model aims to achieve positive results in accounts receivable management, reducing the delinquency rate and achieving optimal cash flow. Upon reviewing the organization's processes, it has been identified that there is a problem of internal and external communication. It is important to emphasize that all areas that have contact with the client make individual efforts to satisfy the client so that the quality of service is not affected (Figure 3).

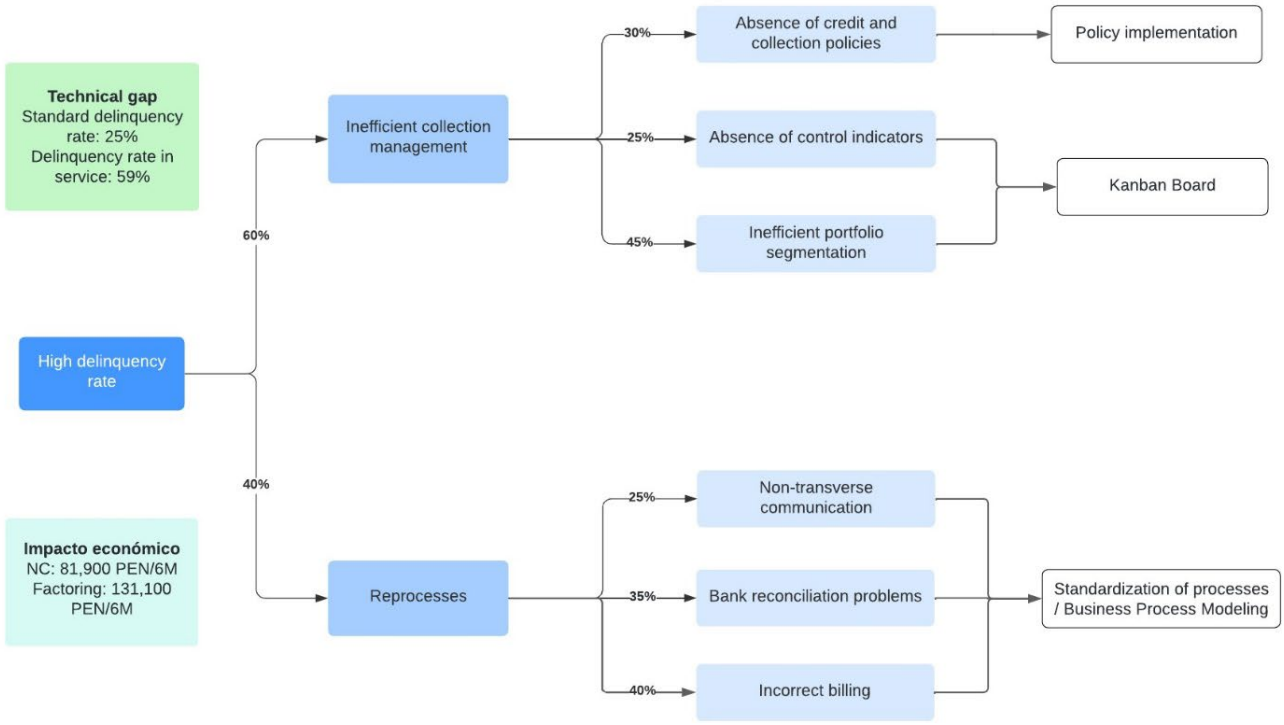

Figure 3. Problem tree

4.2 Business Process Model Implementation (BPM)

According to the diagnosis given, the need to map the processes using the BPM tool was determined. Among the activities carried out, reprocessing was detected, since there are activities that are manual and that could be facilitated with outsourced services that do not involve much expense, as in the case of bank reconciliation. There are also activities that require support from other areas; Therefore, it was proposed to involve the billing, commercial and collections areas in the development of the process model.

In the case of bank reconciliation, it was reviewed with those in charge of bank management and there are products that speed up bank reconciliation. The reconciliation service will be used from the payment for the client of 02 banking entities, the main ones in the company's money management.

What the service does is register the document that is going to be paid from the transaction, so that it arrives properly identified. Later, you can work on automatic reconciliation with some more technological tool, it would be a later stage. On the other hand, reprocessing in billing has little room to occur; within the new policies it is considered that before billing there is approval from the project manager or client account manager. With this important milestone, 98% of the invoices should be accepted and no credit notes should be generated due to errors.

Clients and their projects must be classified according to the policies or commercial agreements agreed upon, the purpose is to avoid errors in billing and have the reference to do active document tracking management. For this, in the commercial system they created categories and subcategories where the important considerations for billing are detailed (Figure 4).

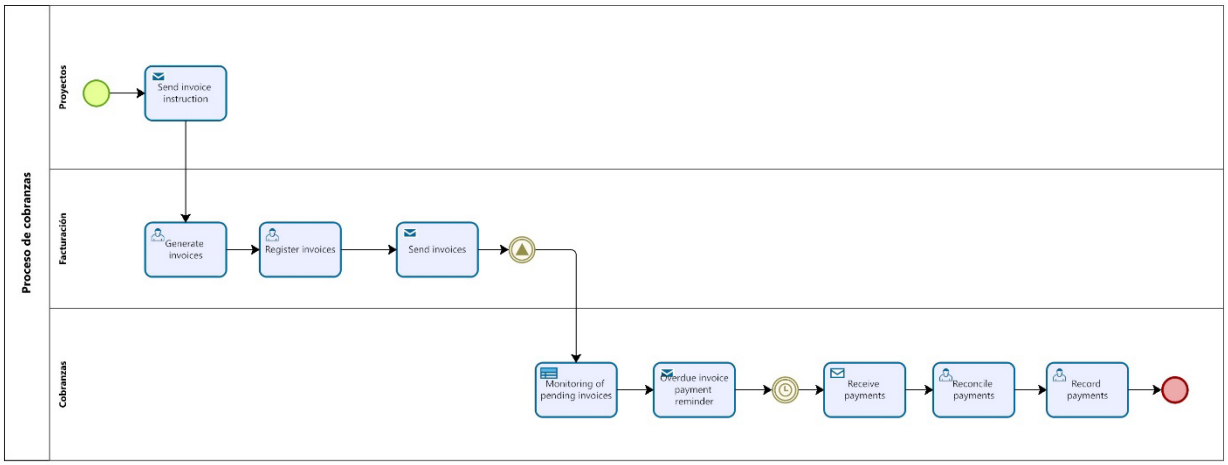

Figure 4. TO-BE Diagram

4.3 Policy implementation

For the granting of credit, a joint evaluation will be made involving the commercial and collection areas. On the one hand, the commercial area will provide information on the customer's historical relationship. On the other hand, the collections area will evaluate the client's capacity and make the credit analysis taking into account the 5'Cs, which consists of the following factors: character referred to the credit history, financial capacity of the applicant, capital made up of assets, collateral derived from the credit guarantees and conditions of the internal and external environment (Hernádez, Galeana, Valenzo, & Chávez, 2017) Then jointly the decision will be made on granting approval or denial credit; if approved, the payment conditions must be defined, which may be 30, 60 or 90 days in exceptional cases. Customers may request special credit extensions upon evaluation.
In order to increase customer loyalty and satisfaction, a discount will be granted for prompt payment. Ideally, the following discount will be applied to the total amount of the invoice:

- If the customer pays up to 15 days before the due date, 7% will be granted.
- If the customer pays up to 07 days before the due date, 5% will be granted.
- If the customer pays up to 02 days before the due date, 2% will be granted.

Commercial area will be in charge of having the necessary contacts and information to coordinate with clients, both with the project area and the collection area.
In addition, it will not be possible to have an invoice issued if the project manager has not given the instruction to the invoicing area. The purpose of this is to ensure that invoices are not rejected by the customer. The scenario is encouraging, since by including the operation team that maintains active contact with the client, this will serve as a means of agile and effective communication in the event of any doubt or complaint, thus avoiding credit notes due to errors in invoicing.
With the standardized processes, it is expected to give the necessary follow-up to the collection, in order to ensure that payment terms are met and to take immediate action if necessary. Also, with the help of the Kanban board, periodic joint reviews will be carried out to visualize how the collection process is going and to take note of the prioritization of accounts receivable that are within the applicable range for discounts.

4.4 Kanban Board Implementation

After having identified the problems and thus having implemented a process standardization and policy implementation tool, the final step is the implementation of the Kanban Board. This board will allow us to have better visibility and organization in the face of the lack of portfolio segmentation that exists in the initial diagnosis.

With the Kanban tool, team management is centralized and work ties are shortened. Having a grid of cards with alarms shared in real time helps the leader to know the load and progress of each member of his team. The main categories of the dashboard will identify the status of collections by job and customer, the status of invoicing by process and product type, the solution of claims with attention dates, and the control of factoring and discounts for prompt payment

granted as a loyalty measure. And in a timely manner, not to leave the list of customers who become uncollectible in order to see legal actions by management.

It has been determined to characterize the stages of the collection process according to: accounts receivable pending, past due, prioritized, under negotiation, under legal management, no response, payment promised or accounts collected.

As for card signals, the invoice number, client, amount, gloss, maturity up to 30, 60, 90 and more than 90 days and project manager will be included.

With this tool, it is expected that the delinquency rate will decrease, since visual management will help prevent invoices from stagnating and increase the number of days past due (Figure 5).

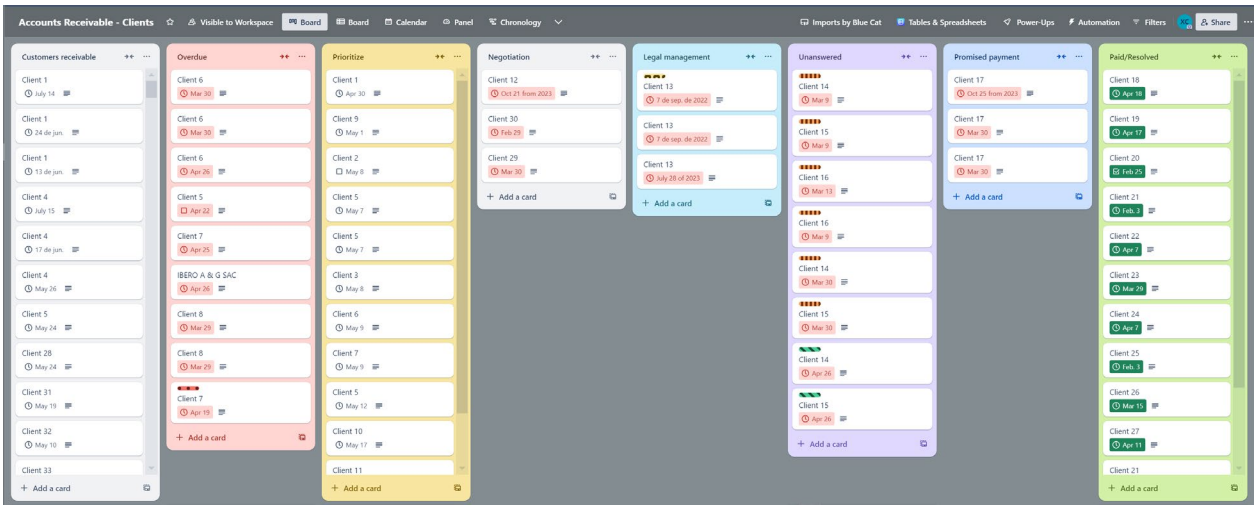

Figure 5. Kanban Board

5. Results and Discussion

Based on the proposed model, which involves the standardization of processes and the implementation of the Kanban Board, significant improvements in the collection process and management have been evidenced. A decrease in the delinquency rate was observed, which initially stood at 59.28%, showing that more than half of the accounts receivable were overdue, which confirmed from that moment on that there was a problem in the portfolio. After implementing the standardization of processes and working under the management of the Kanban Board, it has been shown that it has been possible to collect faster by converting the collection into cash, as well as reducing the delinquent portfolio by 16.5%, being now at an average of 42.78%. It should be noted that, although the delinquency rate has decreased, there are still accounts receivable older than 120 days, since these are invoices that were issued prior to the improvement, but every effort is being made to recover those payments. This can be seen in the percentage indicators of accounts receivable according to the number of days past due, as shown in the Table 1 below:

Table 1. Project Indicators

Indicator	Methodology/Tools	As is	To be	Results	Variation (%)
Delinquency rate (%)	Collection management model	59%	30%	43%	-28%
Prompt payment (%)	Policy implementation	49%	55%	71%	45%
Average collection period (days)	Kanban Board	54	30	31	-43%
Document errors (%)	Standardization of processes	9%	5%	6%	-33%

6. Conclusion

In this study, a significant improvement in accounts receivable management was demonstrated through the implementation of an agile management model using the Kanban tool. The standardization of processes, coupled with clear policies and the incorporation of tracking technologies, resulted in a 28% reduction in the delinquency rate compared to the initial diagnosis. This change highlights the effectiveness of the proposed model in the context of consulting service companies, emphasizing the relevance of agile methodologies in financial management.

The research underscores the importance of interactions between sales and collections departments. Traditionally siloed, the integration of these areas has proven to be crucial for improving operational and financial efficiency. Adopting a systematic and coordinated approach not only optimizes accounts receivable management but also significantly contributes to the company's cash flow, which is vital for its sustainability and economic growth in competitive markets.

The contribution of this study to the field of industrial engineering is considerable, mainly due to its focus on integrating visual management tools like Kanban into financial management, an area traditionally less associated with these methodologies. Moreover, the use of standardized policies and procedures ensures greater consistency and predictability in operations, facilitating continuous and adaptive improvement in response to market changes.

In conclusion, the research demonstrates that implementing an accounts receivable management model based on agile principles and process standardization can have a profound and positive impact on a company's financial health. For future studies, it would be beneficial to explore the adaptability and effectiveness of this model across different industrial sectors, as well as its integration with other emerging technologies such as artificial intelligence and machine learning for credit risk prediction and management. This direction would not only broaden the applicability of the model but also contribute to its refinement and effectiveness in various business environments.

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Biographies

Ximena Naomi Paredes Chirinos has a bachelor's degree in industrial engineering from the University of Lima, Faculty of Engineering. She has experience in service companies and data analysis.

Nicolas Mateo Caballero Carpio has a bachelor's degree in industrial engineering from the University of Lima, Faculty of Engineering. He has experience leading management and operations projects.

Juan Carlos Quiroz-Flores holds an MBA from Universidad ESAN. Industrial Engineer from Universidad de Lima. Ph.D. in Industrial Engineering from Universidad Nacional Mayor de San Marcos, Black Belt in Lean Six Sigma. He is currently an undergraduate professor and researcher at the University of Lima. Expert in Lean Supply Chain and Operations with more than 20 years of professional experience in the direction and management of operations, process improvement, and productivity; specialist in implementing Continuous Improvement Projects, PDCA, TOC, and Lean Six Sigma. Leader of the transformation, productivity, and change generation projects. Able to form high-performance teams aligned with the company's "Continuous Improvement" strategies and programs. He has published journal articles and conferences indexed in Scopus and Web of Science. His research interests include supply chain and logistics management, lean manufacturing, Lean Six Sigma, business process management, agribusiness, design work, facility layout design, systematic distribution planning, quality management, Industry 4.0, Digital Transformation, and Lean Manufacturing. He is a classified researcher by the National Council of Science, Technology, and Technological Innovation of Peru (CONCYTEC) and a member of IEOM, IISE, ASQ, IEEE, and CIP (College of Engineers of Peru).