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Filipe Quartin

“Simplified CRM Solution for SMEs”

Progress Report

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# 1. Introduction

The integration of Customer Relationship Management (CRM) technology within small and medium-sized enterprises (SMEs) is a multifaceted endeavour, influenced by a myriad of factors including relative advantage, cost-effectiveness, top management support, IT knowledge, government backing, and competitive pressure. This complexity is underscored by the scholarly work of (Ramaseshan and Kiat 2008), who provides a foundational understanding of these influencing factors.

1.1 The Impact of CRM on SMEs: A Double-Edged Sword

The potential benefits of CRM for SMEs, such as enhanced performance and a competitive edge, are well-documented by researchers like (Mohamad *et al.* 2014) and (Kim-Soon and Zulkifli 2012). However, the implementation journey is fraught with challenges, notably the complexity of data integration and the demands of e-CRM. (Lawson-Body, Illia and Jimenez 2006) and (Qian and Xu 2012) offer a cautionary perspective, highlighting these hurdles that can stymie the effective adoption of CRM technologies. Yet, these challenges are not insurmountable. Solutions such as data web integration and the outsourcing of CRM services present viable paths forward, potentially reducing both costs and implementation risks.

## 1.2 The High Cost and Complexity Dilemma

The financial and operational burdens of CRM implementation cannot be overstated. Both (Reichold, Kolbe and Brenner 1999) and (Mishra and Mishra 2009) emphasize the significant investment and intricate nature of deploying CRM systems, with (Reichold, Kolbe and Brenner 1999) particularly noting the challenges in measuring outcomes. This brings us to the problem statement of the project: the development of a simplified, yet effective CRM system tailored for SMEs. This initiative is born out of a recognition of the need for less complexity and more affordability in CRM solutions, aiming to democratize access to technology that can empower SMEs to thrive in competitive markets.

## 1.3 Toward a Simplified CRM Solution for SMEs

This project endeavors to bridge the gap identified in current CRM offerings, focusing on the development of a streamlined CRM platform that addresses the core needs of SMEs without the burden of unnecessary features or prohibitive costs. By concentrating on user-friendly design, essential functionalities, and scalable architecture, the proposed CRM system aims to alleviate the challenges highlighted by previous research.

In conclusion, the successful implementation of CRM in SMEs requires a nuanced understanding of both the potential benefits and inherent challenges. By drawing insights from existing literature and focusing on simplification and cost-effectiveness, this project seeks to offer a practical solution that supports SMEs in harnessing the power of CRM for sustained growth and competitiveness.

# 2. Project Evaluation (Methods)

To collect feedback to improve the CRM will be done by questioning some employees form a company where I am doing a part time, and the use of CRM is a daily task.

## 2.1 Simplicity

The cornerstone of the evaluation process is simplicity. This encompasses not only the ease of use but also the ease of implementation and maintenance. To evaluate simplicity, it is going to:

* User Testing: Conduct testing sessions with SME owners and employees to assess their ability to navigate and utilize the CRM without prior training. This real-world feedback is invaluable for identifying complexity that needs to be simplified.
* Feature Review: Analyse each feature for its direct benefit to SME operations, ensuring that each component of the CRM adds value without adding unnecessary complexity (See appendix B).

## 2.2 Automation

Automation stands as a key benefit of an effective CRM system, aiming to reduce manual tasks and streamline business processes. The evaluation of automation will focus on:

* Efficiency Gains: Measure the time saved on tasks that the CRM automates, comparing the before and after scenarios for SMEs. This quantifies the direct impact of automation on operational efficiency.
* Error Reduction: Assess how automation contributes to reducing errors in data entry and management, a common challenge for SMEs. Fewer errors translate to higher data quality and reliability.

## 2.3 UX/UI Design

The user experience (UX) and user interface (UI) design are critical for ensuring that the CRM is not only functional but also intuitive and engaging. To evaluate UX/UI, it will focus on:

* User Satisfaction Surveys: Gather feedback on the aesthetics, navigation, and overall user satisfaction with the CRM system. This helps in understanding how users perceive the system and what improvements are necessary.
* Heuristic Evaluation: conduct a heuristic evaluation of the CRM, identifying usability issues and areas for enhancement based on established UX principles.

## 2.4 Documentation

Comprehensive and understandable documentation is essential for empowering users to make the most of the CRM system. The evaluation will include:

* Accessibility and Clarity: Ensure that documentation is easily accessible and written in clear. This makes it easier for SMEs without IT expertise to utilize the system effectively.
* Usefulness: Evaluate the documentation's effectiveness in helping users solve common problems and perform tasks. This involves testing the documentation in real-world scenarios to ensure it addresses user needs.

By employing these evaluation methods, it is aimed to develop a CRM system that is not only tailored to the unique needs of SMEs but also stands out for its simplicity, automation capabilities, user-friendly design, and comprehensive documentation. This approach ensures that the final product is not just a tool but a solution that SMEs can rely on for their customer relationship management needs, fostering growth and efficiency in their operations.

# 3. Project Progress

## 3.1 Containerization Efforts:

Docker Implementation: We've containerized both the front-end and back-end parts of the project using Docker. This step ensures the CRM system is scalable, making it easier to manage, update, and deploy without disrupting the user experience.

## 3.2 Technology Stack:

* Back-End Development: We're building the back end with Go (Golang), chosen for its efficiency and scalability. Golang's performance is ideal for handling the data processing and business logic for the CRM.

Initially It was planed to use Aerospike a noSql database, but after talking with my supervisor I realised the challenges I would face by using it so I decided to use a SQL database CRM (See appendix A).

* Front-End Communication: The front end is developed using React Native, facilitating a responsive and intuitive user interface. We've implemented Cross-Origin Resource Sharing (CORS) to enable secure communication between the front-end and back-end containers. This setup ensures that the CRM's user interface is not only appealing but also seamlessly interacts with the back end for a smooth user experience (See appendix A).

4. Project Management

4.1 Project Breakdown and Estimative Timeline

### 4.1.1. Backend Development (150h)

Database (40h): Design and setup database schema, focusing on users, sessions, and essential CRM entities (e.g., contacts, opportunities).

Users & Sessions (30h): Implement authentication, user management, and session handling.

Routes (10h): Define and implement API routes for CRUD operations on main entities.

Implementation of Features (50): Develop core CRM functionalities such as lead tracking, customer management, and interaction logs.

### 4.1.2. Frontend Development (100h)

Prototyping (40 h): Use tools like Figma to design UI prototypes for key pages.

Common Design Elements (10 h): Develop a common header and reusable UI components.

Page Development (50 h): Implement the frontend for specified pages based on the prototypes and backend APIs.

### 4.1.3. Integration and Testing (20 h)

Integrate frontend with backend services.

Conduct thorough testing (unit, integration, and user acceptance tests).

### 4.1.4. Reporting (130 h)

Documentation (20 h): Document the architecture, features, and user guide.

Final Testing and Fixes (10 h): Address any remaining issues.

Report Writing (100 h): Compile project reports, results, and learnings.

## 4.2 Gantt Chart Creation

A graph with different colored squares

Description automatically generated

## 4.3 Agile Practices to Follow

This section outlines the sprint planning schedule, detailing key milestones and objectives for each sprint.

Sprint Planning:

* Sprint n° 1: Initial Review and Planning  
  Start Date: 11/02/2024  
  Objective: Send the project proposal for review to the supervisor. This sprint focuses on finalizing the project scope and obtaining initial feedback.
* Sprint n° 2: Assessment Submission  
  Start Date: 15/02/2024  
  Objective: Submission of the initial assessment to outline the project's framework and Agile methodologies to be employed.
* Sprint n° 3: Setting Up the Foundation  
  Start Date: 24/02/2024  
  Objective: Begin the development of the basic frontend interface and creation of database tables. This sprint lays the technical groundwork for the project.
* Sprint n° 4: User Login System  
  Start Date: 01/03/2024  
  Objective: Implement a secure login system for users. This sprint ensures that user authentication is in place for the CRM.
* Sprint n° 5: Ticketing System Setup  
  Start Date: 15/03/2024  
  Objective: Develop the basic setup for the ticketing system. This includes the ability for users to create, view, and manage tickets.
* Sprint n° 6: Enhancing CRM Functionality  
  Start Date: 03/04/2024  
  Objective: Add additional features and automation to the CRM. This sprint focuses on enhancing the CRM's capabilities to improve user experience and operational efficiency.
* Sprint n° 7: Report Initiation and Testing  
  Start Date: 06/04/2024  
  Objective: Start compiling the project report while continuing with the testing phase. This sprint aims to identify and address any issues or bugs.
* Sprint n° 8: Final Testing and Adjustments  
  Start Date: 30/04/2024  
  Objective: Finalize testing and make necessary adjustments based on feedback. This sprint is critical for ensuring the project's readiness for final review.
* Final Sprint: Feedback Implementation and Submission  
  Start Date: 01/05/2024  
  Objective: Implement final feedback and make last-minute adjustments before submission. This sprint is dedicated to polishing the project for final evaluation.

Sprint Reviews and Retrospectives: At the end of each sprint, review work completed and discuss lessons learned to improve the next sprint with the supervisor (send email if necessary).

# 5. Roadmap for Implementation and Future Developments

The next steps in the development of this CRM project are pivotal in establishing a robust platform that meets the needs of both administrators and users while integrating an efficient ticketing system. The following outlines the key phases and features planned for implementation:

## 5.1 Finalizing the Database Choice

Decision on SQL Database: A final decision is needed regarding the selection between MySQL and PostgreSQL. This choice is due to the recommendation of the supervisor of not using a timeseries database.

## 5.2 Developing the User System

Basic User System Implementation: The initial phase involves setting up a user system that allows for account creation. Administrators without a registered company in the CRM will be able to register through the admin portal. Following this, administrators can add "normal" users to their organization, who will then access the CRM through the user portal.

## 5.3 Integrating the Ticketing API

Ticketing System Development: A ticketing API (see appendix C) will be utilized to enable users to open tickets and track their status. This functionality extends to the admin portal, where tickets can be viewed, their status updated, and comments added for further clarification and tracking.

## 5.4 Enhancing Ticket Management

**Label Creation for Tickets**:

To facilitate future analytics and statistics, labels will be introduced for ticket categorization. This will aid in the development of graphical representations of ticket data, enhancing insights into support operations.

**SLA Configuration**:

Service Level Agreements (SLAs) for tickets will be configurable within the admin settings, ensuring that response and resolution times meet predefined criteria, thereby improving service quality.

## 5.5 Automating Processes

User and Admin Automations: The system will incorporate automations for both users and administrators. For example, automations can manage inventory by deducting stock when a new user is onboarded and automatically ordering more from providers when stock levels are critically low, or close a ticket when the user don’t give feedback for a certain amount of time.

## 5.6 Future Feature Development

Continuous Feature Implementation: Depending on the project timeline and resource availability, additional features will be considered for implementation. These enhancements will be aimed at improving user experience, expanding functionality, and ensuring the CRM system remains competitive and responsive to user needs.

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# Draft Literature Survey

## Appendix A

### 1.1 Advantages of Using Golang for CRM Development:

1. Optimized Performance and Scalability:

Golang is known for its excellent performance thanks to its compiled nature, which can lead to faster execution times compared to interpreted languages (Ueda and Ohara 2017), (Lion *et al.* 2022).This is crucial for CRM systems that need to handle large volumes of data and user requests efficiently. Additionally, Go's built-in support for concurrent programming allows for easy scalability, making it suitable for building high-performance CRM systems that can grow with your business. (F. S. Shoumik *et al.* 2017)

1. Code Simplicity and Maintenance Efficiency::

Go's syntax is clean and concise, which makes the codebase easier to read and maintain. This is beneficial for long-term CRM projects involving multiple developers, as it facilitates understanding and working with the code (Abhinav *et al.* 2020).

1. Extensive and Robust Standard Library:

Go comes with a comprehensive standard library that offers a wide range of functionalities, including HTTP server and client packages, JSON encoding and decoding, and more. This can accelerate the development process of CRM features such as API integrations, data processing, and communication interfaces (Bodner 2024).

1. High compatibility with Docker:   
   Golang is a suitable language for creating Docker containers, as it is used to provision system programming to the container (Biradar, R Shekhar and A. Pranayanath Reddy 2018). The language's concurrency models, including message passing, can help in creating reliable and efficient multi-threaded software (Tu *et al.* 2019).

### 1.2 The Role of React in Enhancing User Interfaces

React, a modern web development framework, is highly regarded for its ability to create dynamic user interfaces for single-page applications (Rawat and Mahajan 2020). Its smart diffing algorithm and use of reusable components make it a powerful tool for UI/UX design. Additionally, its flexibility and rich library of features allow for a wide range of customization (Rawat and Mahajan 2020).

The combination of React and Golang offers several benefits. Golang, a statically typed, compiled language, is known for its efficiency and performance (Donovan and Kernighan 2015)When used with React, a JavaScript library for building user interfaces, Golang can enhance the performance of web applications by providing a fast and reliable backend (Levesque *et al.* 1997). This combination is particularly useful for applications that require real-time updates and high levels of interactivity, such as those in the field of biological pathways (Schmidt *et al.* 2006). Additionally, Golang's support for concurrent programming can be leveraged to handle multiple requests efficiently, further enhancing the user experience (Mcilraith and Son ).

## Appendix B

For businesses prioritizing information technology (IT), integrating Customer Relationship Management (CRM) and IT Service Management (ITSM) is crucial. CRM focuses on keeping customers satisfied and loyal, while ITSM ensures seamless technology operations. (Farzin and Abadi 2014) highlights the necessity of suitable technology tools for CRM effectiveness. (Sen and Sinha 2011) argues for the alignment of CRM strategies with the company's tech infrastructure, supported by (Gneiser 2010) who notes the importance of collaboration among marketing, finance, and technology teams for CRM to add value.

In essence, the success of CRM systems relies heavily on the underlying IT infrastructure's ability to support customer engagement tools effectively. This interdependence underscores the seamless integration of CRM and ITSM as fundamental for maintaining robust customer relationships.

### 2.1 Leveraging ITIL and COBIT 5 for Enhanced ITSM

ITIL and COBIT 5 serve as key frameworks guiding the management and enhancement of IT services, combining to offer a unified strategy for ITSM and governance. ITIL provides a detailed methodology for the planning, delivery, and maintenance of IT services, aiming to align these services with business objectives, as outlined by (Zhong Yao and Xin Wang Jun 2010) , (Kabachinski 2011), and (McNaughton, Ray and Lewis 2010). These frameworks emphasize the importance of continuous service improvement.

### 2.2 Integrating Six Sigma with ITIL

(Chan *et al.* 2009) proposes integrating Six Sigma with ITIL to further enhance IT service management. Six Sigma's process improvement and error reduction capabilities complement ITIL's structured approach, offering a powerful combination for boosting IT service quality and efficiency.

### COBIT 5's Contribution to IT Governance

COBIT 5 broadens the focus to include IT governance and risk management, crucial for setting IT objectives, improving information quality, and enhancing business value. (Arthananda and Wella 2022) and (Tsai *et al.* Dec 1, 2015) discuss COBIT 5's role in internal control improvement and risk management, highlighting its utility in addressing potential service and governance issues.

### 2.3 The Synergistic Effect of ITIL and COBIT 5

Combining ITIL's service management processes with COBIT 5's governance and risk management frameworks enables businesses to develop a comprehensive ITSM strategy. This synergy ensures efficient IT service delivery, aligns IT operations with business goals, and supports continuous improvement, paving the way for operational excellence and enhanced IT governance.

## Appendix C

## 3. Ticketing Role and plan

The ticketing system is crucial in IT service management (ITSM), facilitating support for both clients and support teams. According to (Gohil and Kumar 2019) ,it's indispensable for offering efficient solutions in ITSM, aligning perfectly with ITIL practices that aim to synchronize IT services with business needs, a sentiment echoed by (Tawar 2013) who underscores its necessity in improving IT services.

Guided by the project supervisor's insights, an in-depth analysis of TM Forum's documents, particularly TMF621B and TMF724 “ (Anon. a) and (Anon. b) “ was conducted. TMF621B (Anon. a) sets forth the standards for Trouble Ticket API implementation, emphasizing the need for strict testing and validation to meet operational and technical requirements. TMF724 (Anon. b) expands on this, covering the Incident Management API REST Specification, advocating for a comprehensive strategy that spans the entire incident management lifecycle. This approach aims to streamline responses and minimize business disruptions.

The TM Forum has established a robust framework aimed at refining the management of services and incidents within the telecommunications sector. These standards are pivotal in promoting operational efficiency and ensuring prompt, effective resolution of customer issues, thereby enhancing service quality and satisfaction. By standardizing trouble ticket and incident management processes, the TM Forum enables a unified service management approach across the industry, essential for interoperability and the delivery of consistent, high-quality services.

In light of the strategic significance of these standards, the project's ticketing system is based on the recommended API. This decision reflects a commitment to adopting best practices in ticketing system implementation, ensuring the CRM's ITSM component is both efficient and compliant with top industry standards. This approach is aimed at bolstering service management and incident resolution capabilities, ultimately improving service quality and customer satisfaction.

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