Research of Point-of-Sale Systems for Integrating International Business Operations

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Abstract

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This research is to evaluate potential systems and acquire the suitable one to solve the challenges that Bali Brunch Oy, a company in the food and beverage industry, faces in running its core business activities. Daily business activities include sales management, orders, production, inventory, and Human Resources (HR). Currently, the company uses several systems to handle different tasks, which became an issue when it started to expand its business. As the company is also expanding internationally, it needs a system that can efficiently handle its business tasks to improve performance and deliver value streams.

All business activities must run on a unified platform and be available on all devices, such as desktop computers, laptops, and mobile devices. Real-time data must also be available to any user and accessible from anywhere in the world. This research aims to find the right system where the company can store, analyze, and share its data globally.

In this research, existing Point-of-Sale (POS) systems on the market will be evaluated, focusing on Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems. A POS system is a computerized system used to streamline the process of selling a product or service. The research applies a qualitative methodology for data analysis. The data collection process comprises primary and secondary data to establish the proper system structure and system requirements specification.

The results of this project will be crucial to determine what system the company needs to acquire, which will be the backbone of the entire business operation. This research benefits those running a small or medium-sized company focusing on the food and beverage industry with a digital transformation in their business plan.

Keywords
point-of-sale, enterprise architecture, cloud computing, enterprise resource planning, customer relationship management

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LIST OF ABBREVIATIONS

BSP	Business Systems Planning
COBIT	Control Objectives for Information Technology and Related Technologies
CRM	Customer Relationship Management
DARPA	Defense Advanced Research Projects Agency
EA	Enterprise Architecture
ERP	Enterprise Resource Planning
HR	Human Resources
IaaS	Infrastructure as a Service
ITIL	Information Technology Infrastructure Library
MIT	Massachusetts Institute of Technology
PaaS	Platform as a Service
POS	Point-of-Sale
SaaS	Software as a Service
SAP	System Applications and Products in Data Processing
SME	Small and Medium-sized Enterprises
SWOT	Strengths Weaknesses Opportunities Threats
TOGAF	The Open Group Architecture Framework

1 Introduction

Bali Brunch is a company in the food and beverage business; it started in 2012 as a pop-up restaurant introducing Indonesian food and culture to the Finnish market. At the beginning of their journey, they participated in various food festivals, such as World Village Festival and Restaurant Day events, selling food on the street or in a park. In 2017, they opened their first restaurant in Helsinki and then expanded to the cities of Espoo and Tampere. Their latest project is to open a new restaurant in Amsterdam, Netherlands, in November 2022.

The company's vision is to share its love for Indonesian cuisine and its tradition with its customers. They also offer other services, such as catering and cooking classes for special occasions. Their business motto is "Life is simple, be happy."

As their business expands, they face new challenges in daily business activities. They currently use multiple systems to manage business tasks such as sales, purchasing raw materials, inventory, and HR. Everything is manageable but time-consuming; the company needs to become more productive and cost-efficient. In addition, the company has recently received an investment that will allow it to continue to grow; therefore, it needs a solution to maximize its performance and achieve more productivity.

The research evaluates the current structure of the company’s technology, understands the needs of the company, and overlooks the missing components in the current systems. This research examines various factors, such as business requirements, functional requirements, integration with existing systems, budget, and resources.

Four potential new systems are assessed based on their popularity in today's market to determine the best possible solution for the business. The research results will decide whether an ERP or CRM system would be the right solution for the company. Alternatively, a combination of both systems could be the ideal solution. Since the goal is to have a globally available system, cloud services are also the focus of this research.

1.1 Structure of the thesis

This thesis focuses on researching available systems as a solution for a restaurant business. Thus, it does not create a specific product but provides an answer to the challenges and problems by procuring the right system to improve the technological development of the business. This thesis consists of six main topics.

The first topic explains the company's background and defines the research's objective. The second section comprises the business requirements and how the company adopt the Enterprise Architecture frameworks for digital transformation. The third topic covers the theoretical part of the thesis consisting of the theory of cloud computing and their roles in ERP and CRM systems. In addition, the analysis of the basic concepts of ERP and CRM systems in helping businesses manage and perform everyday tasks. The fourth topic of this thesis explains the research methodology chosen for the study. The subtopics of the fourth part of this thesis are to evaluate the research problem, the research questions, the expected outcome, and the scope of this research in more detail. The fifth chapter of this thesis covers the data topic, including data collection, analysis, and summary. The final chapter concludes this research and provides the final analysis and conclusion.

2 Business requirements

The following are Bali Brunch's main business processes, among others, and their current challenges:

- Sales Process

Current sales operate through point-of-sale systems, takeaway sales supported by third-party companies operate through their systems, and other sales, such as catering events, are handled through invoicing by an accounting system. Various sales operations through different systems are problematic as reports must be delivered to the accountant and ensure that all data are accurate. The lack of information leads to problems with taxation and inaccurate reports on business performance.

- Purchasing process

Communication with vendors and suppliers is through various channels, such as online web shops, emails, and phone calls. The process is a simple task that the person in charge of orders can do. However, it becomes more complex when assigning this task to another person. The company also aims to have a unified system for its different branches.

- Inventory management

The current inventory system provides information on how many items are available in restaurants and kitchens but only stores data. It cannot perform an automated task, and integration is unavailable with other systems, such as cash registers or accounting software. Integration is needed to optimize ordering processes. The company can control food costs by ordering the correct quantity of food, avoiding unnecessary food waste, and company can do cost planning accordingly.

- Human resources

Payroll and employee management are separate from one system; accounting software handles payroll and some levels of employee management. At the same time, a different system operates other levels of employee management, such as employee work schedules. The challenge is that the calculation of working hours and submission is done manually from one system to another; risking data integration and incorrect compliance payments can further put the business at risk.

2.1 Enterprise architecture

> White (2018) defines Enterprise architecture (EA) as a process by which organizations standardize and organize IT infrastructure to align with business goals.
>
> However, Cheng (2021) described it as how businesses plan to adopt and utilize technology to meet their desired business vision.

EA started in the 1960s under the term Business Systems Planning (BSP) and developed its framework due to increased business technology. These strategies support digital transformation, IT growth, and the modernization of IT as a department.

> "Modern EA strategies extend this philosophy to the entire business, not just IT, to ensure the business is aligned with digital transformation strategies and technological growth" (White 2018).

Although large businesses benefit most from an EA strategy, SMEs could also benefit from using this framework. It helps to show how information, business, and technology work together because it combines people, data, and technology to establish an understandable view of their relationships.

The most significant benefits of EA include the following:

- Enabling more open collaboration between IT and business units
- Allowing companies to prioritize investments
- Facilitating the evaluation of existing architecture against long-term goals
- Establishing processes for evaluating and procuring technology
- Provide all business units outside of IT with a comprehensive view of the architecture
- Prove a benchmarking framework to compare results with other organizations or standards

(CompTIA 2022)

2.1.1 Domains of enterprise architecture

EA defines organizational structures layer by layer, with four layers forming the overall architecture:

1. Business layer

   EA organizes the day-to-day business processes, such as organizational and business relationships. It also includes business functions, goals, and overall strategies of the company.

2. Applications

   The application architecture identifies the applications, interactions, and relationships with the core business.

3. Information and data

   Information and data architecture includes the structure of the data and the management of data resources.

4. Technology

   The technology architecture identifies the software and hardware needed to implement other areas specified in technology architecture.

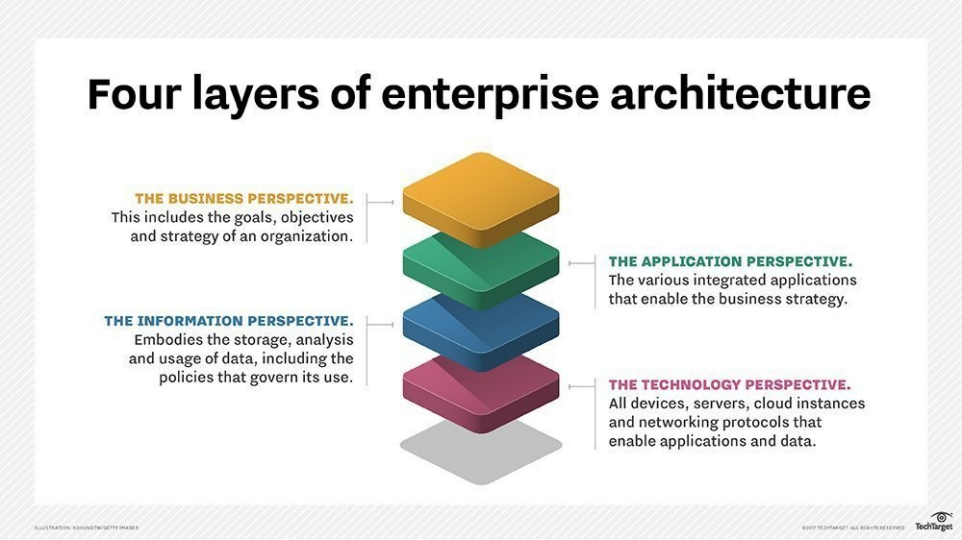


Figure 1. Four layers of enterprise architecture (adaptive from Cheng 2021)

2.1.2 Enterprise architecture frameworks

There are three main frameworks used by enterprises and deployed in their organizations. They are all similar but differ in scope and target audience. Below are some of the most important EA frameworks:

- Information Technology Infrastructure Library (ITIL)

  ITIL is the most globally known collection of best practices for IT Service Management. It enables businesses to change their frameworks to achieve excellence in performance and overcome the challenges associated with the growth of IT systems in their companies.

- Control Objectives for Information Technology and Related Technologies (COBIT)

  Information Technology Management and IT Governance are why COBIT developed. It helps businesses to understand their information systems and maintain control over their security and risk management. COBIT creates optimal value by balancing the realization of benefits with the optimization of risks and resource use.
  (B2B Learning 2022)

- The Open Group Architecture Framework (TOGAF)

  > TOGAF is an enterprise architecture framework that provides an approach for designing, planning, implementing, and managing an enterprise information technology architecture. It is typically modelled at four levels: Business, Application, Data, and Technology. It relies heavily on modularization, standardization, and already existing, proven technologies and products. (7HiLL bv 2020)

All three frameworks serve the same purpose: to simplify business processes in a model that is easier to understand and use. Each framework has its purpose and place in a business. Bali Brunch is starting its digital transformation and will put EA practices on its business transformation roadmap. Investing in agility, user-centricity, and next-generation technologies is the best way to deliver solutions.

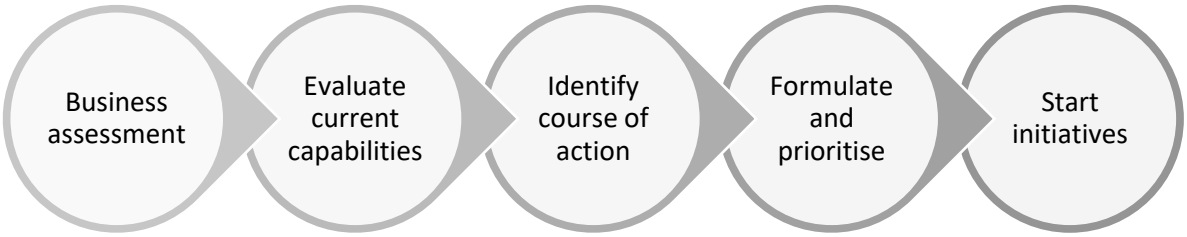


Figure 2. Company's roadmap to digital transformation

3 Cloud-based systems

> “In 1963, DARPA (the Defense Advanced Research Projects Agency) presented the Massachusetts Institute of Technology (MIT) with $2 million for Project MAC. The funding included a requirement for MIT to develop technology allowing for a "computer to be used by two or more people, simultaneously". In this case, one of those gigantic, archaic computers using reels of magnetic tape for memory and became the precursor to what has now become collectively known as cloud computing. It acted as a primitive cloud with two or three people accessing it” (Foote 2022).

Before the birth of “cloud” technology, on-premises computing was the only option companies could rely on to do their business tasks. On-premises software was installed and configured on computers, devices, or servers. Businesses had to store all their data on their hard drives and servers, which became a problem as the company expanded. It causes many challenges, such as costs, unavailability of storage space, security issues and outages.

> “The term "cloud" originated from the image used in diagrams to represent the transport of data, and this concept dates back as early as 1961” (Rittinghouse, JW, & Ransome 2009, 27).

> “The concept of cloud computing supports the need for a modern IT environment, that is, to increase capacity or add capacities to their infrastructure without investing money in the purchase of new infrastructure” (Rittinghouse, JW, & Ransome 2009, 29).

When the need for real-time data and data availability across multiple devices arise, the answer to that challenge is a cloud-based solution.

> “Cloud computing delivers computing services such as servers, storage, databases, networking, software, analytics, and intelligence over the Internet” (Microsoft Azure 2022).

There is a sudden urge among businesses to move to the cloud system; one of the reasons is the changing economic conditions. Companies need to increase efficiency by discovering innovative working methods and spending less money. They also need to embrace digital transformation to keep up with their competitors.

> “A 2020 survey by Centrify and CensusWide found that 43% of businesses surveyed have yet to fully migrate to the cloud by March 2020. However, due to the COVID-19 pandemic, 48% are now streamlining their cloud migration plans and around 36% plan on digitizing more of their processes using cloud technology” (Upwork Global Inc 2021).

> “In 2020, the global cloud computing market was valued at $371.4 billion, and it is estimated that by 2025 it will rise to a staggering $832.1 billion” (Marketsandmarkets 2022).

Another driving force that pushes a business to the cloud is the affordability of cloud-based systems for small and medium enterprises with different business models, as they do not have the budget or resources to invest in a particular IT department. The recent epidemic caused by Covid-19 is also one of the factors that are making businesses realize that cloud computing is the solution which allows businesses to complete daily tasks without employees having to be in the same room. Employees can work remotely, and they can communicate wherever they are. Companies

can save costs by not renting or owning a physical office and only needing a few employees to get work done.

> “When we talk about cloud, it’s no longer a future issue; it’s a present and essential element, addressing real business needs, adding simplicity and security, and helping to accelerate innovation and growth. These benefits can’t be ignored” (Mason 2015).

3.1 Background

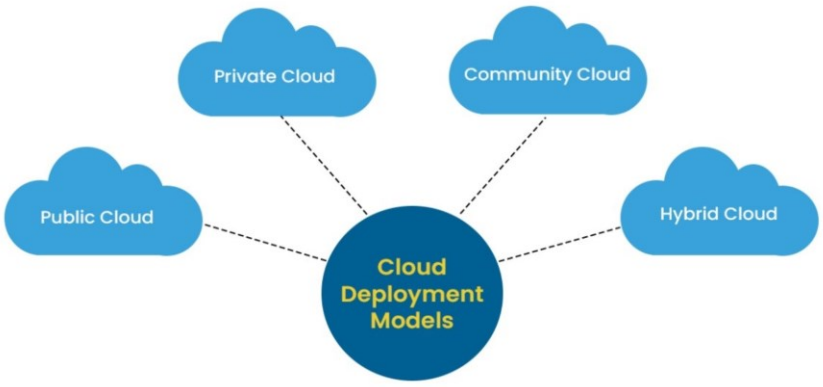


Figure 3. Cloud deployment models (adaptive from Kale 2021)

Deployment models in figure 3 hold on to the same principle of virtualization. Virtualization is a technology that allows sharing of resources between different computers. However, the level of security and management required the data to be processed differently. The hybrid cloud model enables the exchange of information between public and private environments. Multiple users share resources in a public cloud environment to ensure data integrity. In a private cloud environment, the infrastructure is developed specifically for a particular organization, and they may only share information within that organization's environment. This way, organizations can keep their most secret data safe in the private environment while using the public environment to meet their business needs. Finally, a community cloud is an infrastructure of shared resources between organizations in the same industry. This environment has many factors to consider, including compliance with policies and security regulations.

3.2 Cloud services

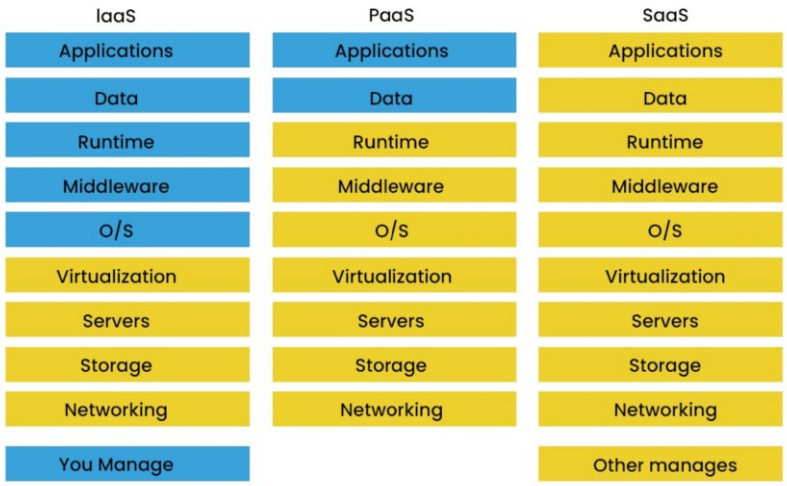


Figure 4. Types of cloud services (adaptive from Kale 2021)

- IaaS (Infrastructure as a Service)

The service provider maintains the infrastructure, such as servers, networks, virtualization, and data storage, and offers their customers the possibility to rent or lease those servers and storage. Users can run their operating systems on those servers without worrying about maintenance. Some examples of this service are Microsoft Azure and Amazon Web Services (AWS).

- PaaS (Platform as a Service)

It means that the user handles the application on top of the platform and handles the data, but the service provider takes care of the hardware and provides the application software platform. This type of service is suitable for programmers and developers as they are not required to build and maintain the infrastructure.

- SaaS (Software as a Service)

SaaS provides all cloud computing layers of the infrastructure. It is the most popular type of cloud service. This type of service delivers applications through a browser using multiuser architecture. One benefit of using this service type is that there are no up-front investment costs in servers or licensing. Salesforce is one of the best-known examples of this type of cloud service. Salesforce.com was founded in 1999 by former Oracle executive Marc Benioff, who pioneered the

concept of delivering enterprise applications through a simple website. Salesforce is the pioneer in bringing the cloud system into CRM.

3.3 Cloud ERP and Cloud CRM

Businesses need a cloud ERP or CRM solution to scale their operations as the information is accessible globally. Another advantage of this system for small and medium-sized enterprises (SMEs) is that anyone with proper training in the company can use the system. Businesses do not need a special IT department to manage their business technology, as the system's provider oversees the IT infrastructure.

Real-time analytics are also what cloud ERP and CRM offer, multiple users across countries or continents can share or change data, and it is displayed simultaneously to all who need it. This process speeds up business decision-making at a crucial time when something needs to be analyzed quickly.

Cloud ERP or CRM is also the perfect option for businesses on a limited budget, as they can choose only the type of services they need without purchasing the whole system. There are no upfront licensing fees or surprise costs in the future, as the system provider usually offers a subscription model that suits the business. Businesses pay for precisely the amount of the system they use.

Some disadvantages of using cloud ERP or CRM systems are that the data is not private because the system provider has access or hackers can steal data. Since users do not own the system, they must be prepared for possible system updates and train their businesses to adapt to the new system changes. Finally, the availability of an internet connection is key to the entire cloud system. If users do not have access to the internet, they will not have access to the system.

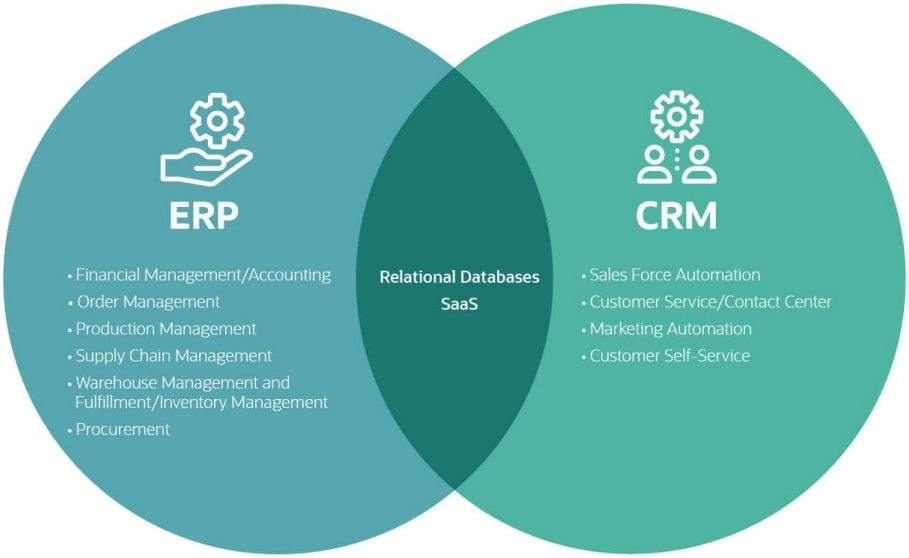


Figure 5. Relationship between ERP and CRM systems (adaptive from Oracle NetSuite 2022)

> "ERP helps businesses run a successful business by connecting their financial and operational systems to a central database, while CRM helps manage how customers interact with their business" (Oracle NetSuite 2022).

Both systems perform essential functions by storing and analyzing data in a relational database and functioning within a SaaS service. Initially, CRM development was for big enterprise sales departments. It has since evolved into a platform that supports businesses' sales and commerce, service, marketing, and IT teams. On the other hand,

> "ERP started as a material requirement planning system for manufacturers to understand and manage their resources" (Carutasu 2016).

ERP then evolved into a system that handles financial matters and its core elements, such as general ledger, payroll, and financial reporting. ERP also includes order management, HR, eCommerce, and inventory management.

The main difference between the two systems is that ERP is primarily used to manage financial data, while CRM manages the customer data used by the sales department. In addition, some ERP systems include a CRM component, but not the opposite.

Growing businesses will eventually need an ERP and a CRM system (or a single platform running both systems). Ultimately, both approaches are essential for most businesses. The question is, which strategy should help a company in succeeding fastest? It depends on the business model,

whether the company should tackle complex financial tasks to ensure business performance or whether a business that relies on customer interactions should implement a CRM system first.

3.4 Benefits of cloud system solutions

There are many benefits of applying a cloud system solution to a business, and there is almost no reason for a company not to. Some of those benefits are the possibility of accessing data and information anywhere in the world using any device. Businesses do not need to invest much money in purchasing hardware and do not need servers of their own, cables, or backup generators. The risk of data loss is much less because of the data backups centralization in the cloud's providers' data centres. Also, whenever a business needs to have a specific service added to its existing one, the deployment process is easy and fast because the system's providers already have every service available in the cloud. Another advantage of using a cloud system service is that businesses have instant access to their business insights as soon as it is collected, which could help in fast decision-making.

> As stated by Oracle 2022, cloud computing is a greener technology than traditional IT solutions. Businesses can reduce their energy consumption and carbon footprint by up to 90%.

Nowadays, every business uses some cloud solution system or software, for example, email service, office software, security software or storage of files. Undeniably, this technology will continue to evolve as many service providers compete to offer their customers a way of doing work that requires less time, with no special skills needed through intuitive and user-friendly systems and applications.

3.5 Cloud system implementation

The key to the success of any project is planning, a good plan not only consists of a timeline or checklist, but it also sets expectations and allow space for changes and adjustments. Defining the main reason why implementation was in the first place needed will be the guide for the entire implementation plan. Setting goals is also significant, such as optimizing sales processes and inventory levels and enhancing reporting. Budgeting is also one of the critical successes in cloud system implementation; how much does the business willing to invest and assess how that investment will pay off. Also, learning new skills and changing ways of thinking and doing things must be changed to achieve successful implementation.

Lastly, deciding when the actual data transfer will happen from a previous system to a new one. This process is called a cloud migration. The migration process runs on the cloud-based infrastructure provided by the public cloud service provider. There are four steps in the cloud migration process:

1. Cloud migration planning

   Determine what features of the public cloud will serve the business by assessing the business requirements.
2. Migration Business Case

   After the compilation process of business requirements, businesses need to understand the services offered by cloud providers and their costs. The company needs to build a business case for every application planned to be migrated to the cloud and assess their operational benefits, cost-effectiveness, and architectural improvements.
3. Cloud Data Migration Execution

   The actual data transfer process once a plan and environment assessment is compiled. The main challenge is to undergo this process with minimal disruption to normal business operations at the lowest cost and over the shortest time.
4. Ongoing Upkeep

   Once data has been migrated to the cloud, real-time monitoring ensures that information is always optimized and secure.

3.6 Implementation challenges and issues

Identifying possible risks can reduce the challenges that the business might face. However, as much as a company could identify risks early, some surprises might come later, and these factors must prepare businesses to be able to mitigate or tackle those issues. Document requirements must be collected by involving the stakeholders in the project to meet a shared understanding and fulfil everyone's needs. This requirement document must be carefully gathered, as making changes later on after the product launch will be costly and time-consuming.

Data integration is also one of the challenges during implementation because many cloud-based systems have integration limitations with existing software. Organizational change is another risk when implementing a new system, individuals will have to adjust their routines to handle the data differently, and it will take time for adjustments. However, Bali Brunch is a smaller business, so there is a small amount of personnel and easier to maintain the transition period.

Lastly, choosing the right system provider affects the possible issues that might take place significantly. By selecting a reliable provider, rest assured that support will be available 24/7, and they will provide immediate solutions when needed.

4 Conducting research

The first weeks of the research aim to learn about the business itself closer. What are their daily business activities, and how are they handled? What is the purpose of different systems, and how effective and efficient are they? Forecasting possible processes needed to be added to the system demand list to improve business performance.

Another team collects data collection for the upcoming venue in the Netherlands. That information is combined with the data from this research to be processed individually and as a whole entity. Assessments of different taxation, compliance, and accountancy regulations take part when processing the data. Those are significant matters to consider and oversee regarding how they would affect the final decision.

4.1 Research problem

Bali Brunch utilizes several systems to handle different tasks, such as Restolution and Mando (cash register software), Talenom (accounting), Sortly (inventory management), and Google Sheets (shift list, food and production cost, and sales report). Data gets lost because of the manual task process, and only some materials are delivered digitally. Current systems are sufficient to perform individual tasks but not as one interconnected system. They are time-consuming, and the company could allocate that time for business development. Furthermore, given that new stakeholders are involved, there is a demand for real-time data availability, and data integrity should be maintained and controlled.

Once we understand the entire business tasks and requirements, we could compile a final system demand list. Based on those findings, we will choose one of the four potential systems based on their features and price.

4.2 Research method

There are two main research methods based on data collected during the research process, quantitative and qualitative. Quantitative data consists of numbers and the translation of mathematical operations resulting in helpful information. In comparison,

> “qualitative data are collected by gathering words that are based on people's opinions, judgments, ideas, or beliefs, which is harder to translate and has a different approach in analytical technique” (Walliman 2011, 113).

This research uses the qualitative method of data collection, and there are two approaches to analyzing qualitative data: deductive and inductive. Deductive reasoning, or deductive logic, is an argument used in academia and everyday life.

> “It is alternatively referred to as "top-down" logic because it usually starts with a general statement and ends with a narrower, specific conclusion” (Streefkerk 2022).

> “The general principles of deductive reasoning date back to the Ancient Greek philosopher Aristotle” (Brown 2022).

It is the primary form of reasoning and, in simple words, applying a theory to the data to test that theory. Inductive reasoning, on the other hand, is a method of logical thinking that combines observations, experiences, or facts to conclude a hypothesis.

> “When you use a specific set of data or existing knowledge from past experiences to make decisions, you're using inductive reasoning” (Herrity 2019).

The research method used for this research will be based on the inductive reasoning approach because this research aims to predict an outcome which is the right system for the business by analyzing the data collected. Inductive reasoning begins by processing data and observations to conclude. Deductive reasoning starts from a hypothesis and then processes the data and observation to accept that hypothesis or otherwise.

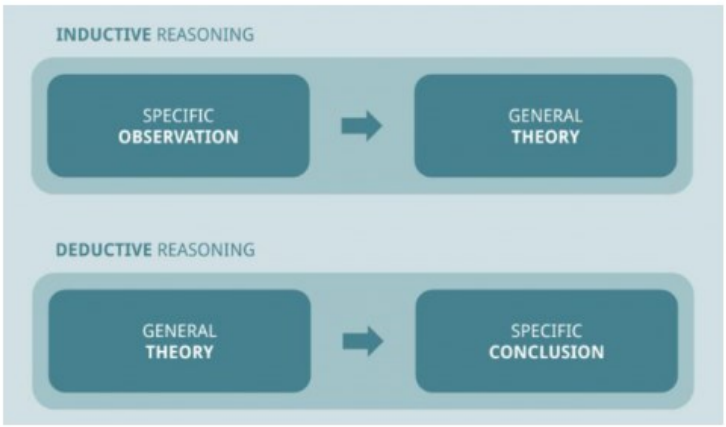


Figure 6. Inductive and deductive reasoning (adaptive from Kumar 2022)

The main questions of this research are as follows:

1. What is the correct type of cloud-based system for the business?
2. Can one cloud-based system execute all core business processes?

In today's fast-growing market, possibilities and solutions are endless. Many system providers offer very competitive features, and systems could easily be modified and adapted specifically for the business needs and size. Nevertheless, everything comes for a fee, and these modifications and additional features come with a price that is usually affordable because of its complexity. Hence, acquiring a stand-alone system that offers the most fitted customized solution specifically for the business will ideally be the goal of this research.

4.3 Expected outcomes

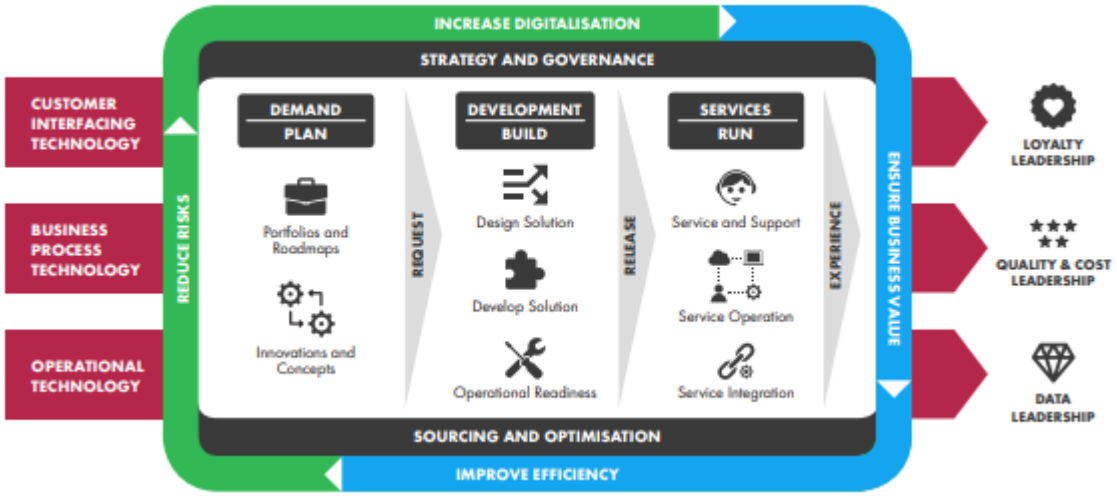


Figure 7. Business technology operating model (adaptive from Business Technology Standard Book. Business Technology Forum 2022)

Bali Brunch is aware that technology plays a significant role in creating business value. From figure 7 above, the operating model ensures that the technology management contributes to business excellence by increasing digitalization, improving efficiency, and providing business benefits. Bali Brunch has implemented a similar operating model with different values to achieve its value streams. However, the general idea is the same, where the business process focuses on enterprise-level and backbone solutions. Most SMEs find that a cloud-based ERP or CRM system is the most suitable option for their businesses when transitioning to the digital world. Some of the reasons for that are that they are less expensive and easier to implement because a third-party provider maintains and develops the software and infrastructure, and its end-users can access the software from any platform over the internet.

The expected outcome from this project is a solution that will deliver their value streams, which are both focusing on operations and development. Operational value streams are business activities needed to deliver their product to the customers, such as ordering raw materials, producing, and selling them. Furthermore, finding the right resources, such as staff, suppliers, and partners, to support the operational value streams is the company's development of their value streams.

4.4 Scope

This project aims to a result as a solution to help the business in improving their business productivity and performance. The result of this research will be a decision on what type of system the company needs to acquire to solve its current issue. Some of the limitations that might await are the accuracy of the information received from the Netherlands team regarding legal matters, regulations, policies, and other guidelines. Hence, a solution that is easy to modify and customize must be acquired. This research will last for three months, and there is no budget allocated for this project as this is only the pre-phase of developing the new system. The next project will continue the purchasing and implementation processes. The figure below best describes the scope of this research.

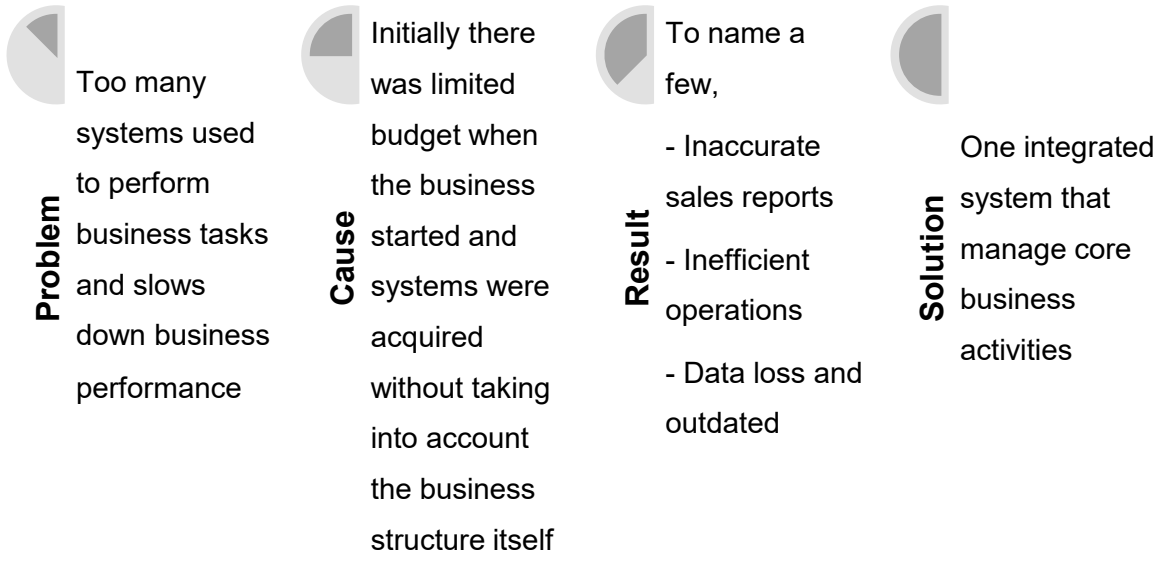


Figure 8. A problem-based approach to concept mapping.

5 Data analysis process

Data hold valuable information when processed thoroughly, and it has the answer to our questions.

> “Data analysis is a process of finding, collecting, cleaning, examining, and modelling data to derive useful information and insights and understand the derived information for data-driven decision-making” (Pickell 2011).

> “Data come in two main forms, primary and secondary data, depending on their closeness to the situation recorded” (Walliman 2011, 92).

Our primary data is collected internally through observations and experiences by analyzing the current system used to understand the business requirements. At the same time, we will use secondary data or external sources to gather information on cloud-based systems available in the market based on documented articles, news, and advertising on the internet.

A significant aspect to consider when using secondary data is that we make the best assessment of the quality of the information through careful analysis. As we cannot test the potential systems in practice, we need to ensure that our decisions are as accurate as possible based on the information we can get.

There are five main steps in the data analysis process:

1. Define questions & goals
2. Collect data from sources
3. Clean through unnecessary data
4. Begin analyzing the data
5. Interpret results and apply them

5.1 Data collection

The method used for primary data collection is observation and experience. Primary data is collected daily through performances of daily business activities. The documentation of findings is overviewed and used for further analysis. Collecting primary data is time-consuming, but through hands-on experiences, the data are accurate.

The first step is identifying essential factors such as business tasks and issues. Then data is collected by isolating and manipulating one or more subjects and how the manipulation affects the business tasks involved in the problems. The process is a continuation of the theory development of the research questions until relevant evidence is collected, which eventually will be the conclusion and findings of this research.

As shown in the picture below, work sequences in this research are an ongoing process as this research aims to reach an outcome. The analysis started by reviewing the subject area (Bali Brunch), then an investigation of a problem area (issues with current systems), then theoretical background and research methods were studied, followed by the data collection and analysis process. Data is continuously collected and assessed until there are no further questions left. In conclusion, summarize the final assessments and areas that need further research.

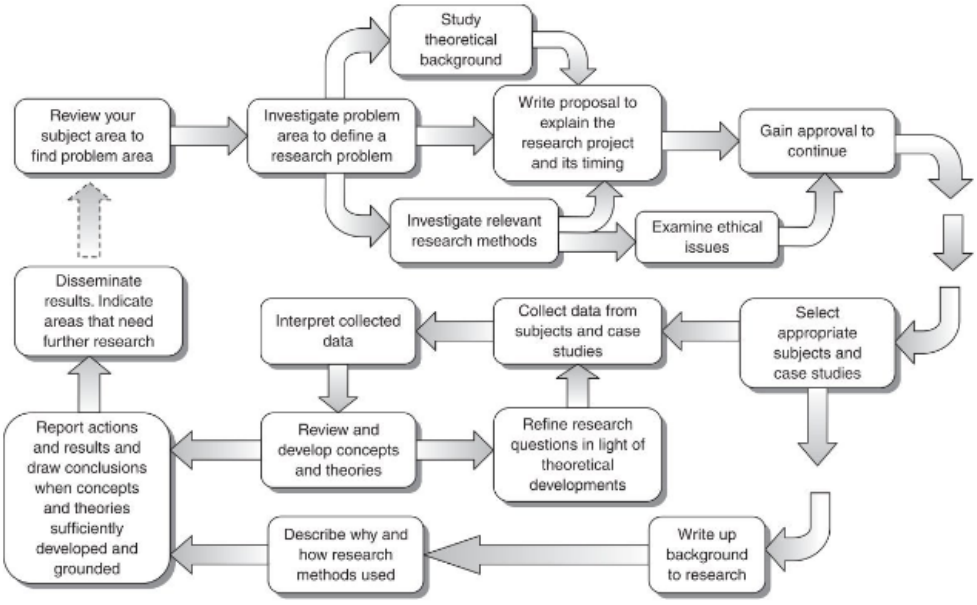


Figure 9. Work sequence in qualitative research (adaptive from Walliman 2011, 129)

5.1.1 Business model canvas

A business model canvas is a tool used to visualize a business idea; it consists of nine main categories that represent the key factors of a business. It is a convenient tool to see the company in one big picture instead of reading through many pages of descriptions.

> “The business model canvas was initially developed by Alex Osterwalder and Yves Pigneur and introduced in their book 'Business Model Generation as a visual framework for planning, developing, and testing the business model(s) of an organization” (Athuraliya 2022).

The business model canvas comprises three main sections. The left side of the canvas focuses on the business's internal factors, the right side focuses on the customer, and the middle is the value proposition that represents the value exchange between the company and the customer. This visualization is not only easier to understand, but it is also easier to be modified and shared with

stakeholders and employees. It is a highly effective and inexpensive tool when brainstorming ideas, suitable for small businesses and corporations.

Nine of the components of the business model canvas are as follow:

- Key partners; there are different types of partners usually involved in the business activities, such as partnerships between partners or cooperation, collaborations with other people or businesses to develop a new kind of business or joint venture, partnerships with vendors or suppliers, and partnerships between non-competitors.
- Key activities include production, finding solutions and creating a platform or network to support specific tasks.
- Key resources are a list of resources the business needs to do its key activities. Resources are human, financial, intellectual, and physical.
- Customer relationships are where businesses list the types of interactions they have with their customers in this section. Several types of relationships could be established, such as personal interaction, where contacts with customers are by phone or email or an online community where information is available for customers when they seek help and can also find support from each other.
- Channels: how businesses communicate with their customers; these channels are either self-owned by the company or by utilizing a partner channel.
- Customer segments are when the target is for certain groups for the product or service the business sells. The mass market focuses on the general population. This niche group focuses on a specific group of people with shared interests and needs, or a diversified group that focuses on people with very different interests.
- The cost structure is a list of expenses businesses must create for their product or service. Generally, companies can either be cost-driven, focusing on minimizing all costs or value-driven, focusing on delivering the maximum quality to their customers.
- Revenue streams are how the business earns its money. There are many ways to generate revenue, such as direct sales, usage fees, renting or leasing, licensing, and advertising.
- Value propositions: this is the core of the business model canvas; it represents the product or service of the business. Value propositions create the values for the customer segment. A value proposition should be unique and different, and it is what distinguish the company from other competitors.

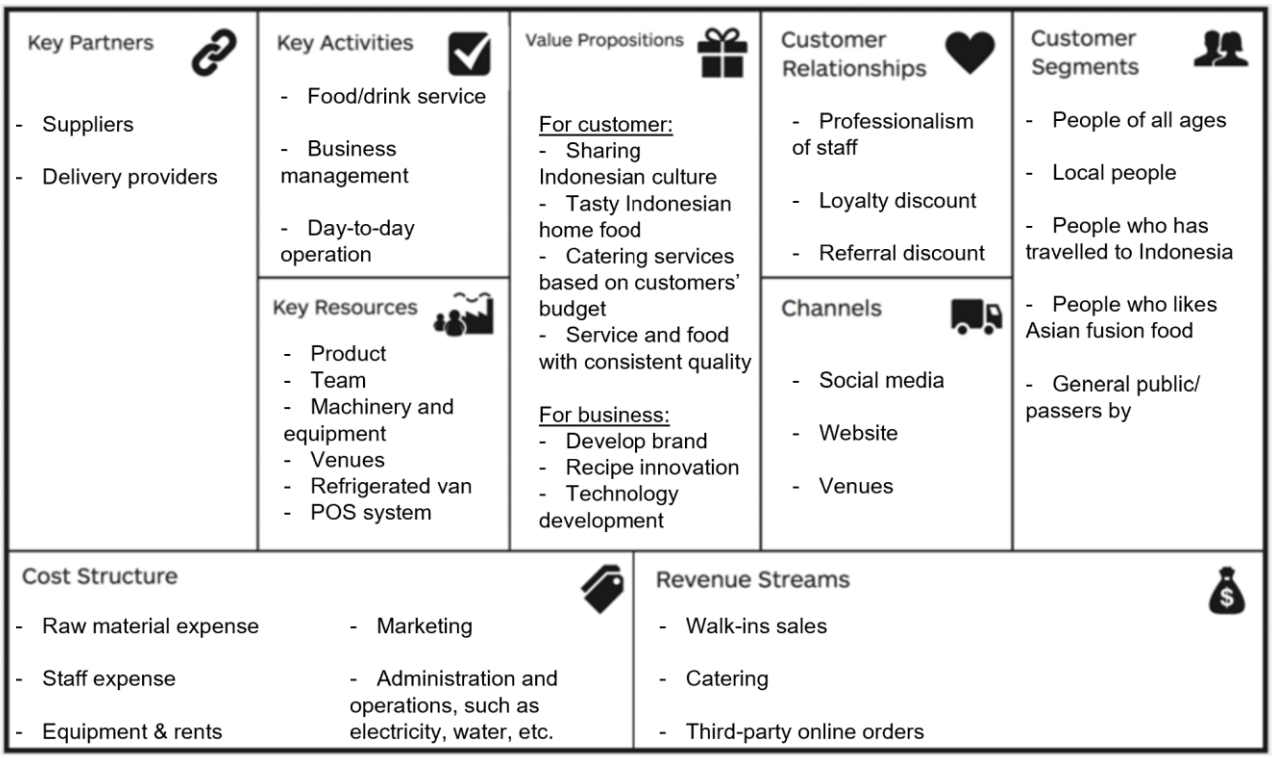


Figure 10. Business canvas model (adaptive from Osterwalder and Pigneur 2010, 16)

5.1.2 System planning

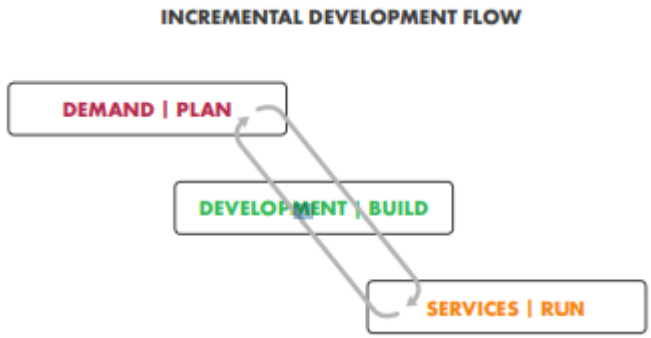


Figure 11. Incremental development flow (adaptive from Business Technology Standard Book. Business Technology Forum 2022)

System planning is the first phase in ensuring the delivery of the business value. It is the overview of business demand merged with new ideas. The development phase follows once this research is done and continues to the implementation of the new system. The last stage of running the system completes the flow, ensuring the business runs smoothly.

5.1.3 SWOT analysis

Albert Humphrey introduced SWOT analysis in the 1960s, which is still effective today. It is a straightforward tool to assess businesses, places, competitors, or self-assessments. Companies use SWOT analysis to measure their Strengths, Weaknesses, Opportunities and Threats. It is beneficial to create a SWOT analysis before implementing a significant change in the business or when a business needs to identify opportunities for growth and improvement. The purpose of the SWOT analysis in this research is to identify key points of where the company stands now and the new opportunities for improvement. Strengths in SWOT identify the areas that are already working in the business. Weaknesses are the factors that are underperforming and need to be improved. Opportunities are created based on the existing strengths and weaknesses that will put the company in a stronger competitive position. Lastly, threats in SWOT analysis are areas with the potential to cause problems, and they are external factors that the business cannot change.

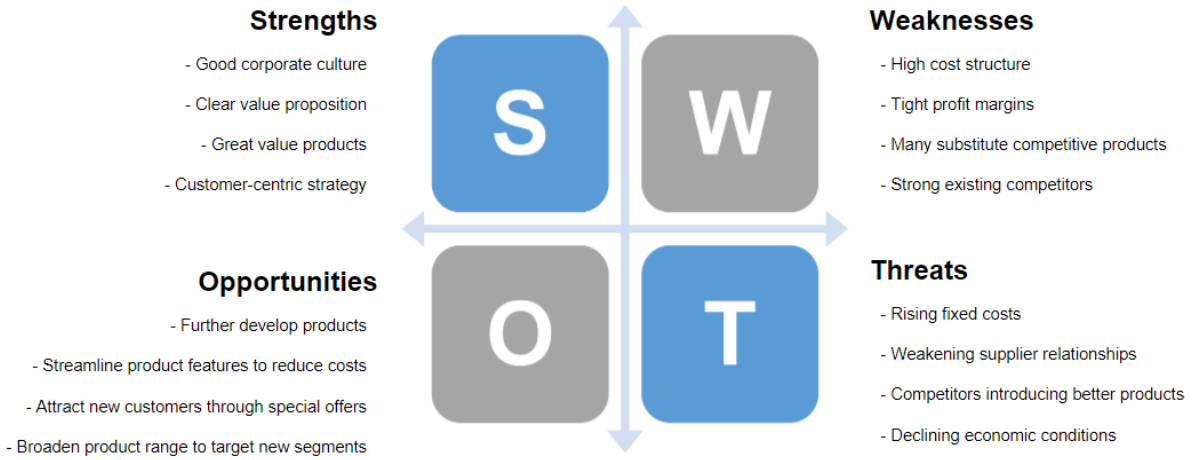


Figure 12. SWOT analysis diagram

5.1.4 Current systems

- Cash registers: Restolution and Mando
    - Functionalities: single restaurant site management, stock control, real-time product maintenance, sales reports, and compatibility with different payment terminals.
    - Issues: inability to deliver sales reports to the accountant.

- Inventory management: Sortly
    - Functionalities: organize and automate inventory, real-time reporting insights, and works across all devices.
    - Issues: when accessed from multiple devices, real-time data experience some delay, and inaccurate information is displayed and misinterpreted by the user.
- Accounting: Talenom Online
    - Functionalities: bookkeeping, invoicing, payments, payroll, and HR management.
    - Issues: system integration with cash register systems and online delivery partners are currently unavailable, which causes the accounting process to take longer time
- Internal reporting and other management: Google Sheets
    - Functionalities: create spreadsheets, shareable content, collaboration, and share data online in real time.
    - Issues: Manual data input and visualization of data are complex, and the inability of system integration and data integrity is prone due to the level of security.

5.1.5 System demand specification

Businesses looking to automate core business activities typically look at two leading cloud-based system solutions, enterprise resource planning (ERP) and customer relationship management (CRM). Both systems offer a solution to make business more profitable and productive through two processes, increasing sales and streamlining every department toward one common goal. Deciding which system is the best for the company will be assessed by features that both ERP and CRM offer. The following table represents the existing business tasks and additional features required in the new system, evaluated by their level of importance.

Table 2. System demand list

Business tasks	Must	Good	Nice	Comments
Sales	x			
Inventory management	x			
Financial reporting (Integrated with Talenom)	x			

Cost analysis		x		incl. budget control and price management
Online order management (Integrated with Wolt & Foodora)	x			integration with Wolt & Foodora
Production management	x			
Recipe management	x			
HR		x		incl. payroll, labour management
Accounting		x		
Restaurant chain management	x			handle multiple outlets
CRM	x			
Order taking system			x	using phones or tablets
Integration capability		x		
Multilingual language support			x	

5.2 Potential systems

The following systems were chosen based on their level of recognition in the market, availability of a cloud-based system, and capability to automate business processes. The list starts with two high-end products, Salesforce, and Oracle NetSuite, followed by two more suitable options for small businesses; Odoo and GoFrugal. Salesforce, Oracle NetSuite, and Odoo are widely used systems, and GoFrugal is on the list because of its popularity in the Netherlands.

5.2.1 Salesforce

> "Salesforce was founded back in 1999 as one of the first cloud computing companies, created by Marc Benioff, a Sales Executive at Oracle" (Crisp 2020).

Salesforce is a CRM software that manages customer relationships, saving customers' information and interactions. It is a task that is quite simple, but what businesses can do about that information

by utilizing Salesforce is what makes Salesforce one of the leading CRM systems in the market. In its 21 years, Salesforce has evolved into a software offering more than just managing customers. Such as automated marketing, web analytics, financial management, human resources, and work-flow management, among many more. Salesforce is a powerful tool for businesses due to its ability to integrate with another system. Salesforce has, in one way or another, solutions for all types of companies regardless its size.

Figure 13. Gartner's magic quadrant for CRM lead management (adaptive Salesforce 2020)

Salesforce does not have a free software version, but it does offer a 30-day free trial for the Sales Cloud with limited functionalities such as:

- Using pre-loaded data or upload own data
- Pre-configured processes, reports, and dashboards
- Guided experiences for sales reps, leaders, and administrators
- Online training and live onboarding webinars

Product demo was also available on their website, documentation, journals, and an online community where users could share their problems and stories and help each other.

Salesforce offers six significant types of clouds:

- Sales Cloud
- Marketing Cloud

- Commerce Cloud
- Service Cloud
- Experience Cloud
- Analytics Cloud

In addition to that, Salesforce offers nine more clouds which are designed explicitly for a particular type of applications and industries:

- Salesforce Integration Cloud
- Salesforce App Cloud
- Salesforce IoT Cloud
- Salesforce Manufacturing Cloud
- Salesforce Financial Services Cloud
- Salesforce Education Cloud
- Salesforce Non-profit Cloud
- Salesforce Health Cloud
- Salesforce Vaccine Cloud

According to Salesforce, the types of cloud services that should be acquired by businesses in the restaurant and hospitality industry, with the possibility of combining them with supported add-ons, are the following:

- Marketing Cloud lets the business personalize the customer experience and optimize campaigns with data-first enterprise solutions for any channel and device.
- Service Cloud, allowing the business to deliver connected, personalized experience at scale from the contact centre to the field - all powered by intelligent automation and real-time data.
- Loyalty Management lets the business build intelligent B2B and B2C loyalty programs that are flexible, configurable, and rapidly deployable.

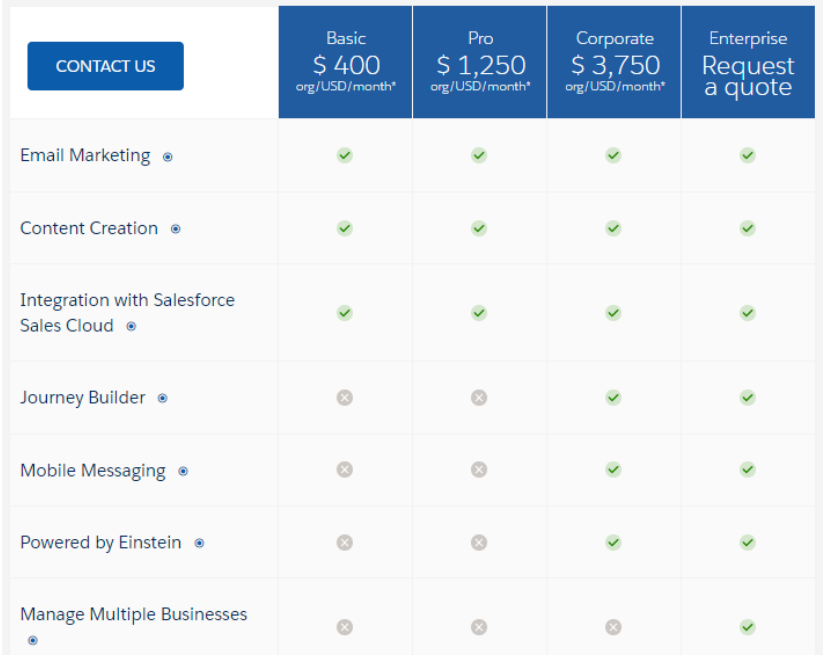
Pricing for the above services is as follows respectively:

CONTACT US	Corporate $ 12,500 org/USD/month*	Enterprise $ 50,000 org/USD/month*	Enterprise Plus $ 65,000 org/USD/month*
Unified Profiles	45K	500K	500K
Super Messages (excluding SMS / MMS)	10M	150M	150M
Segment Publish	20K	100K	100K
Engagement Events	7.5B	25B	25B

Figure 14. Salesforce Marketing Cloud Pricing (adaptive from Salesforce 2022)

TRY FOR FREE	Essentials $ 25 USD/user/month**	Professional $ 75 USD/user/month**	Enterprise $ 150 USD/user/month**	Unlimited $ 300 USD/user/month**
Account, Contact, Lead, and Opportunity Management	✓	✓	✓	✓
Email Integration with Gmail or Outlook	✓	✓	✓	✓
Workflow and Approval Automation	✗	✗	✓	✓
Pipeline and Forecast Management	✗	✓	✓	✓
Sales Engagement and Insights	✗	✗	✗	✓
Sales Insights	✗	✗	✗	✓
Premier Success Plan	✗	✗	✗	✓

Figure 15. Salesforce Service Cloud Pricing (adaptive from Salesforce 2022)



CONTACT US	Basic $ 400 org/USD/month*	Pro $ 1,250 org/USD/month*	Corporate $ 3,750 org/USD/month*	Enterprise Request a quote
Email Marketing	✓	✓	✓	✓
Content Creation	✓	✓	✓	✓
Integration with Salesforce Sales Cloud	✓	✓	✓	✓
Journey Builder	✗	✗	✓	✓
Mobile Messaging	✗	✗	✓	✓
Powered by Einstein	✗	✗	✓	✓
Manage Multiple Businesses	✗	✗	✗	✓

Figure 16. Salesforce Loyalty Management Pricing (adaptive from Salesforce 2022)

5.2.2 Oracle NetSuite

Oracle NetSuite is an ERP system that manages core functions such as finance, accounting, orders, procurement, and inventory. It also allows the integration of other systems, such as CRM for sales, HR, and payroll.

> "Oracle co-founder Larry Ellison convinced entrepreneur Evan Goldberg of the promise of web-based software, leading Goldberg to launch NetLedger, the company that would become NetSuite in 1998. NetSuite gives businesses visibility and control through a single source of real-time information and the ability to add modules on the fly. That increases their efficiency and agility" (Oracle 2022).
>
> "NetSuite is one of the top 10 ERP systems, and its CRM has a market share of 0,94%" (LeadsBridge 2022).

Like Salesforce, NetSuite also comprises different modules such as:

- NetSuite Financial Management Modules
- NetSuite Customer Relationship Management Module
- NetSuite Inventory and Order Management Modules
- NetSuite Commerce Modules
- NetSuite Human Resources Modules
- NetSuite Professional Services Automation Modules

- NetSuite Supply Chain Modules

NetSuite offers a unified solution as a product called NetSuite Restaurant Edition, and it provides the following features:

- Optimized Supply Chain
- Streamlined Sales Cycles
- Financials and Accounting
- Procurement
- Restaurant Inventory
- CRM, Guest Service and Marketing
- Fixed Assets Management
- Franchise Management
- Point-of-sale Integration
- Commissary

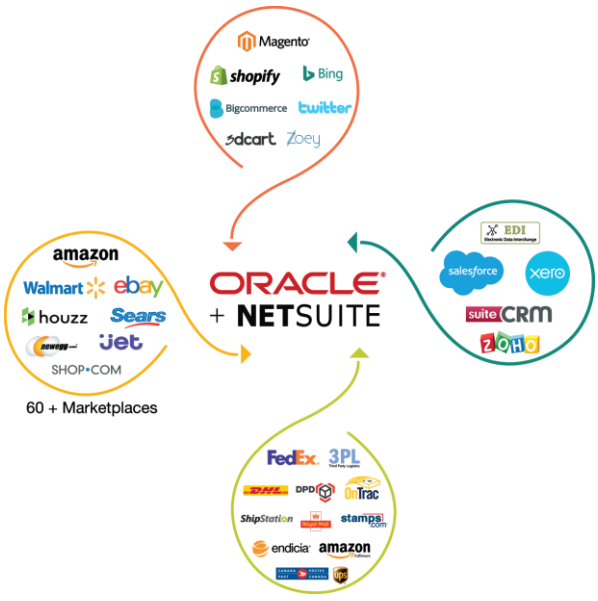


Figure 17. Oracle NetSuite integrations (adaptive from Oracle 2022)

NetSuite ERP supports numerous features and over 450 integrations; it can modify its system for each business model and type. For those reasons, NetSuite does not disclose its pricing information without asking for a quotation.

> “For a general implementation, users must subscribe to an annual license fee comprising three main components: core platform, optional modules, and the number of users. There is also a one-time implementation fee for the initial setup. In summary, pricing could vary from $10,000/year to $1,000,000/year” (Oracle 2022).

NetSuite also does not have any free software version, but potential users can send a request for a 14-day trial, which includes the following services:

> - Free access to a fully provisioned NetSuite user account
> - Optional modules - OneWorld, Fixed Assets, Advanced Inventory
> - Tailored industry datasets may be available
> - A free discovery and training session from RSM professionals
> (Oracle 2022)

Many valuable resources are available on NetSuite's website, such as product demos, articles, and success stories.

5.2.3 Odoo

> “Odoo is a suite of open-source business apps that cover all your company needs: CRM, eCommerce, accounting, inventory, point-of-sale, project management, etc.” (Odoo 2022).

> “Fabien Pinckaers, the founder and current CEO of Odoo, started to develop his first software product, TinyERP, in 2005. Three years later, the name was changed to OpenERP in 2010, and finally, in 2014, the company was renamed Odoo officially, On-Demand-Open-Object in the following years” (Rajasekar 2020).

Odoo falls under the Enterprise and Resource Planning business management tool with the complete capability to manage the company's operation and business management. What distinguishes Odoo from its competitors is that it offers two separate versions of solutions: Odoo Community and Odoo Enterprise. The Community version is open-source, and the Enterprise version supplements the Community version with commercial features and services. Their mission, as updated on their website, is -

> "To provide software that is intuitive, full-featured, tightly integrated, effortless to upgrade, all while running smoothly for every business, every user" (Odoo 2022).

Odoo comprises a unique modules’ architecture, with over 100 different modules or apps. Some of their most popular modules are:

- Sales Management
- Services
- Finance Management

- Inventory Management
- Production Management
- HR Management

The Odoo Community version is free of cost for one app only and unlimited users. The Odoo Enterprise edition offers a 15-day free trial with limited features, which costs $20-$25/per user/month, depending on the billing type per module. Every module or application comes with a specific price.

Odoo stands out from Salesforce and NetSuite in this research because it also offers its intelligent point-of-sale software called Odoo Restaurant. It is a web-based application that does not require installation because it works online. Odoo Restaurant is compatible with any hardware, such as tablets, laptops, desktop computers or even industrial cash register machines. It has an integrated inventory management system which automatically inputs any transaction from the POS in the stock. It is also fully integrated with other Odoo apps, such as email marketing, sales, and e-commerce.

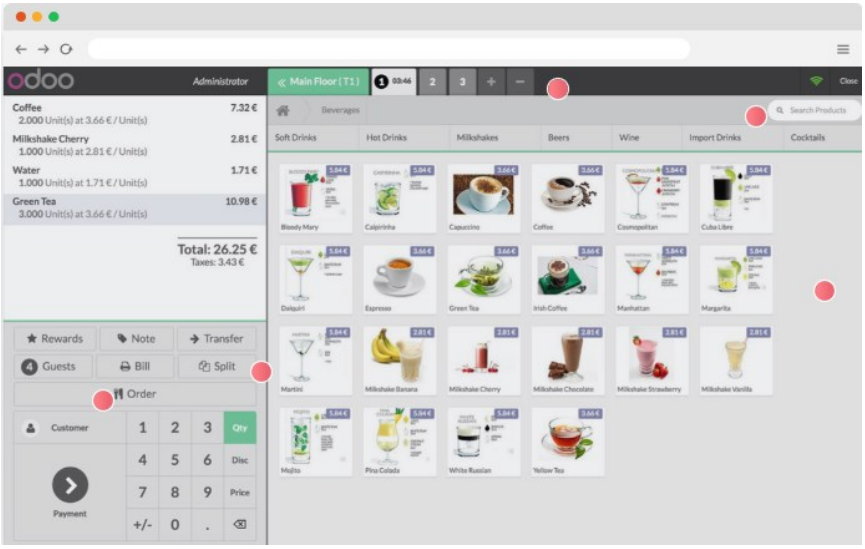


Figure 18. Odoo Restaurant (adaptive from Odoo 2022)

5.2.4 GoFrugal

> “GoFrugal ERP system is a comprehensive billing-to-balance sheet solution scalable to meet the needs of any business” (GoFrugal 2022).

GoFrugal focuses on retail, restaurant, and distribution businesses. It was founded in 2004 by Kumar Vembu to address the organized and unorganized retail market with premium quality, affordable solutions. GoFrugal POS software solution can manage single and multi-location business establishments. It includes core business functionalities such as sales, billing/accounting

management, inventory management, multi-store management, smart analytics and reporting, mobile business apps, purchasing/order management, customer loyalty management and e-commerce integration, among many others.

> “GoFrugal's Restaurant POS software also provides multiple solutions in different modules, such as OrderEasy for online ordering, GoDeliver for delivery management, WhatsNow for complete business assistance and myPulse for customer feedback management” (GoFrugal 2022).

These modules are available in Google Play Store and Apple Store for potential users to download and experience first-hand how the product works and experiment with the interface. This feature proves the company's promise to offer easy-to-use, self-help solutions. Unlike Salesforce, NetSuite and Odoo, GoFrugal is a more compact ERP solution because it focuses on specific types of businesses. The three main products that they offer are:

- Retail Management System (RetailEasy)
- Distributor Management System (ManageEasy)
- Restaurant Management System (ServeEasy)

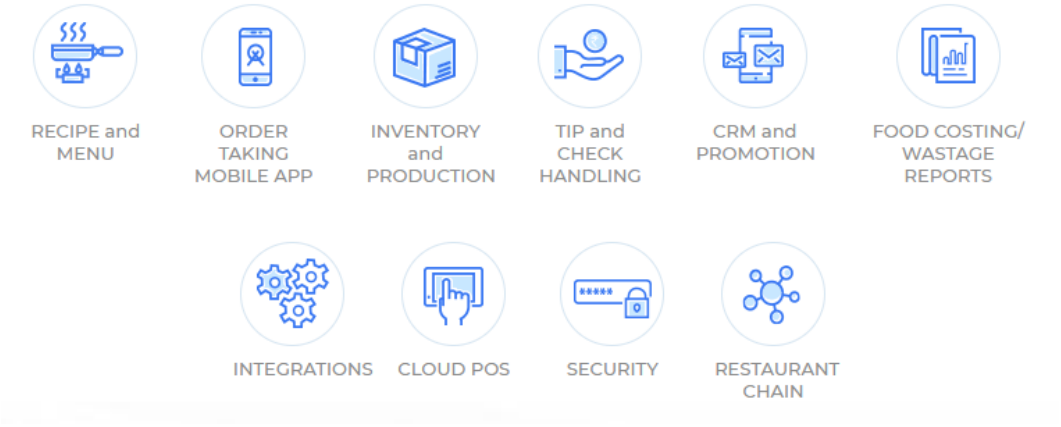


Figure 19. Key features of GoFrugal ServeEasy restaurant POS system (adaptive from GoFrugal 2022)

GoFrugal offers no free version, but a free trial and product demo with limited functions are available. Many resources are available on their websites, such as blogs and online communities. What makes GoFrugal stands out from the other systems previously mentioned, such as Salesforce, NetSuite and Odoo, is that it has a wide range of solutions specifically for restaurant businesses. For example, its Chain Restaurant Software offers the ability to control multiple outlets chain, which serves the following business activities:

- Auditing is made more accessible with the integrated Accounts module

- Maintain the same prices of items at all restaurants
- Maintain the same taste across outlets with the Recipe Manager
- Manage purchases from head office to outlets with Centralized Purchased Control
- Plan and stock inventories based on best sellers with Centralized Inventory Management

Pricing for starter, standard and professional are as follows:

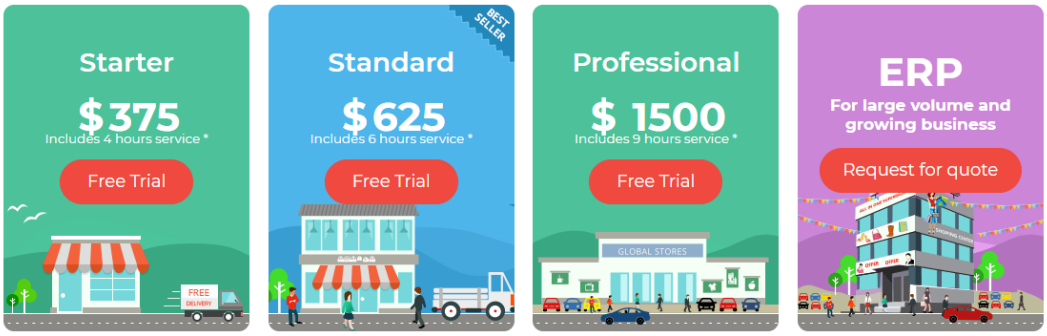


Figure 20. Restaurant management pricing plans (adaptive from GoFrugal 2022).

With the following features:

	Starter	Standard	Professional
+ Sell Management	✓+	✓+	✓+
+ Purchase & Reorder	✓+	✓+	✓
+ Delivery / Parcel Management	✗	✓+	✓
+ Inventory Management	✓+	✓+	✓+
+ Business Operations management	✗	✓+	✓+
+ Pricing Management	✓+	✓+	✓
+ CRM, Loyalty and Promotions	✗	✓+	✓+
+ Reports	✓+	✓+	✓+
+ Business Intelligence & Analytics	✓+	✓+	✓+
+ Multi Location/Division management	✗	✓+	✓+
+ Admin and Security management	✓+	✓+	✓+
+ Recipe Management	✗	✓+	✓
+ Statutory	✓+	✓+	✓+
+ Financial Accounting	✓+	✓+	✓+

Figure 21. GoFrugal pricing plan features (adaptive from GoFrugal 2022)

5.3 System comparison

The following table shows which system can perform the required business tasks based on its stand-alone ability without integrating with another system. All four systems feature sales, purchasing, inventory management, HR, CRM, and integration capabilities. However, integration with third-party online order management systems available in Finland and Amsterdam is not possible through any of the systems.

Table 3. System comparison based on stand-alone mode.

Business tasks	Salesforce	NetSuite	Odoo	GoFrugal
Sales	x	x	x	x
Purchasing	x	x	x	x
Inventory management	x	x	x	x
Financial reporting (integrated with Talenom)			x	
Cost analysis		x	x	x
Online order management (integrated with Wolt and Foodora)				
Production management		x	x	x
Recipe management			x	x
HR	x	x	x	x
Accounting		x	x	x
Restaurant chain management		x	x	x
CRM	x	x	x	x
Order taking system				x
Integration capability	x	x	x	x
Multilingual language support	x	x	x	

5.4 Data summary

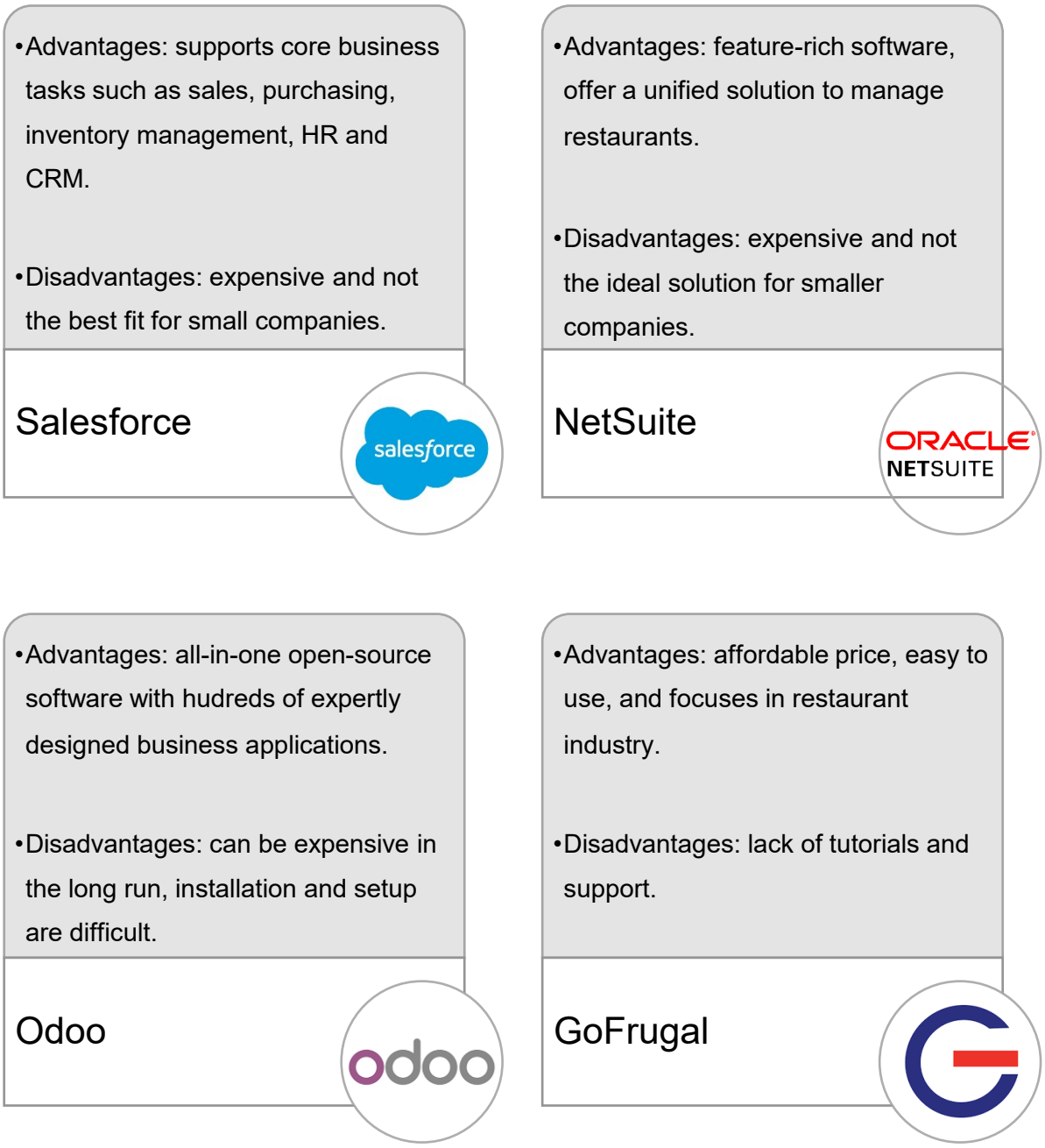


Figure 22. Pros and cons of the four cloud-based systems

6 Conclusions and analysis

This research initially adopted a problem-based approach to concept mapping. Some of the major problems faced by the company are:

- The volume of manual work
- The large number of documents stored in Google Drive, Google Sheets and Dropbox
- Transfer of data is not automatically
- The lack of real-time data

An essential part and a crucial factor to support this research is the list of system requirements prepared by the company and the SWOT analysis compiled by the company. The four pre-selected systems, Salesforce, NetSuite, Odoo and GoFrugal, were evaluated and compared. These systems were selected based on their place and availability in the market, comparing two of the best CRM and ERP systems in the world to two more affordable options that are more suitable for SMEs.

Features and cost are the two essential factors in deciding which system is best for the business. The SWOT analysis helps identify possible business tasks the company needs to improve the business's weaknesses. For example, with the cost analysis system, the company can calculate the percentage of food costs and determine how much the company spend on the restaurant's sales of menu ingredients. Alternatively, if the company expands further into other locations, it is good to have a recipe management system to ensure the quality control of products. Restaurant chain management is also necessary to maintain consistent business performance and obtain real-time business analytics to make decisions faster to remain competitive in the market.

This research initially had a one-size-fits-all approach, which is unsuitable for this company. Nevertheless, the business objectives were clear, and careful consideration took place to assess the capabilities of the product and the solution provider. Therefore, focusing on an industry-specific ERP system that also supports CRM was the right approach to get answers to the research question. An industry-specific ERP system has the advantages of being easy to install and use, accessible from various devices, likely to require fewer resources to complete a business task, and, as the business grows, will be able to manage change with greater efficiency.

We reached sales representatives of each system to get better information about pricing; unfortunately, it was impossible to estimate how much it would initially cost per year due to the need to conduct a proper product quotation. Generally, a small business obtaining Salesforce or NetSuite

would need to spend approximately 100,000 euros. With that information, we narrowed the list to Odoo and GoFrugal.

Both Odoo and GoFrugal offer an industry-specific solution, Odoo for Restaurants and GoFrugal ServeEasy both support featuring their own POS system. However, Odoo has hidden costs such as customizations, data migration and training. Since the company does not have an in-house IT resource, the open source offered by Odoo is not beneficial since it requires Python programming knowledge. GoFrugal, on the other hand, provides a straightforward user interface that is very easy to install and use without the need for any programming languages. GoFrugal pricings are explained on its website and based on its user reviews, and there are no hidden costs for the system. User reviews serve as secondary data and are compiled into table 4 below:

Table 4. User reviews

Odoo	GoFrugal
(+) Extensible module-based architecture	(+) Ability to connect across multiple platforms, windows and mobile
(+) Responsive or mobile-friendly platform	(+) Easy to use and good overall features
(+) Third-party application integration compatibility	(+) Regular updates
(+) Great community support	(+) Affordable cost
(+) Easy to customize	(+) Centralize management
(+) All business processes in one place	(+) Third-party application integration compatibility
(+) Accounting is the core of the system	(+) Industry-specific features
(-) The customer support team is only available on weekdays	(-) They should improve installation and upgrade time
(-) Customer support service is slow	(-) Poor level of support
(-) Hard-to-maintain no-license community version	(-) The system becomes very slow if the system is idle for a long time
(-) No separate packages for small and large enterprise	(-) Customer support over chat is often challenging
(-) It can be complex for new users	(-) It does not support many languages
(-) The initial implementation is difficult	(-) A proper user manual of the software is not available

6.1 Conclusion

This research aims to determine whether a company should implement an ERP or CRM system first. Through inductive reasoning, data was collected and processed and reached a result. System demand specifications list main business activities, and an ERP system could execute those tasks better than a CRM system. However, the company is also customer-centric, which means a CRM system is just as important. Hence, finding a system that could handle both worlds without integration with another system is the ideal solution, which is the answer to the first question of this research.

Information about cost structure, which usually consists of the implementation cost and maintenance cost, could not be determined precisely due to the lack of system requirements details such as customization and configuration, which are still to be figured out by the company at this stage. Therefore, vendors were unable to estimate the actual implementation and maintenance costs.

Based on data analysis, cost structure estimations and user reviews, the most suitable system for the company is GoFrugal. GoFrugal does not require a significant initial investment in the implementation project as Odoo does. The company benefits more from an on-the-go solution with easy installation methods for any user without much IT experience. The missing elements of in-house IT skills and Python knowledge are a significant disadvantage as it closes the option for implementing Odoo in the company.

GoFrugal is the ideal solution for the company as it eliminates the amount of software the company needs to use to perform its core business tasks. GoFrugal offers the solution of obtaining an ERP system with a strong CRM feature that supports the business.

6.2 Further development

The answer to the second research question, whether one cloud-based system could execute all core business processes for the company, is no; one cloud-based system cannot perform all business processes. The following business processes are unable to be completed by GoFrugal:

- Accounting: due to the inability to integrate with the accounting firm's system that the company utilizes.
- Third-party online ordering management systems; GoFrugal currently only supports integration with online order providers such as UberEats, Foodpanda, Swiggy and Zomato, but not Wolt and Foodora.

However, these challenges will be continuously observed and remain in the company’s further project plan. The company has learned that adopting business technology transformation is long and

complex. Transformation is no longer an option, but it is an inevitable part of running a business to maintain its existence. The transformation process consists of different phases; through each stage, the company will discover new capabilities that lead to further opportunities.

6.3 Personal learning

The author had previous hands-on experience with ERP and CRM software systems in brief, such as SAP, Microsoft Dynamics NAV, and Salesforce. Theoretical background research provided the author with much knowledge, such as the history of cloud computing and company business technology developments. Also, the study of different ERP and CRM systems, specifically industry-specific types, has been very educative. This research has taught the author a lot about business processes and challenges. The primary data collection process has been straightforward as the author works closely with the company. Data analysis was also convenient as the author could observe business activities closely through experience and day-to-day activities in which the author is involved. On the other hand, the writing process was very intense as a specific time frame limited the author to complete this thesis. The skills that the author acquired from the writing process of this thesis are reading and writing skills, time management, project management, problem-solving and creating connections between ideas.

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Appendices

Appendix 1. System demand list

1. Cloud-based
2. Software and hardware compatibility
3. Applications have different access rights over other users
4. Applications provide a backup facility for the data
5. User-friendly system
6. Reliable support and customer service
7. Comprehensive training
8. Secure mobility
9. Offline protection
10. Automatic updates
11. Integrated sales reports (cash registers and third-party applications)
12. CRM
13. Product Catalogue
14. Third-party online ordering and delivery service integration
15. Improve communication between the front and back of the house
16. Automated reminders
17. Multilingual support
18. Inventory control
19. Payroll service
20. Employee scheduling
21. Integration with accounting software
22. Daily, monthly, and annual transaction reports
23. Transaction reports for a certain period

24. Graphical reports
25. Detailed product reports
26. Daily, monthly, and yearly income statements
27. Merged profit and loss for a certain period
28. Daily, monthly, and annual cash flow statements
29. Cash flow statements for a certain period
30. Quality measure
31. Easy menu setup
32. Cost analysis
33. Recipe management
34. Loyalty and rewards points
35. Social media integration
36. Simplify vendor relations
37. Improve profit margin
38. Sustainability
39. Restaurant chain management
40. E-commerce