



Degree project in Technology

First Cycle 15 ECTS

Digitalization of Small and Medium-Sized Enterprises: A Framework for AI and E-Commerce-Based Workflow Automation

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Digitalization of Small and Medium-Sized Enterprises: A Framework for AI and E-Commerce-Based Workflow Automation

Digitalisering av Små och Medelstora Företag: En Modell för AI- och E-handelsbaserad Arbetsflödesautomatisering

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Abstract— This study investigates how small and medium-sized enterprises (SMEs) can adopt digital tools to improve administrative efficiency, using the Swedish, sustainable catering company Sopköket as a case study. The project had four digitalization aspects: Generative AI for email automation, an e-commerce website, API-based invoicing, and a website-integrated AI agent. The main goal was to reduce manual tasks, save resources, and enhance the customer journey. Based on process mapping, staff interviews, and prototypes, a generalizable SME Digitalization Framework was developed. This iterative model consists of four phases: Diagnose & Prioritize, Select & Prototype, Evaluate & Validate, and Scale & Sustain. The framework was based on the outcomes of the case and backed by theories including Lean Management, the Technology Acceptance Model (TAM), and the Resource-Based View (RBV). Digitalization led to reductions in administrative time, resource savings, and more consistent customer interactions. Results indicate that resource-constrained SMEs can achieve digital transformation through accessible technologies. By translating case insights into a structure, this project contributes a roadmap for SME digitalization and a reflection on the impact it has on sustainability.

Sammanfattning— Denna studie undersöker hur små och medelstora företag (SMF) kan använda digitala verktyg för att förbättra administrativ effektivitet, med det svenska, hållbara cateringföretaget Sopköket som fallstudie. Projektet omfattade fyra digitaliseringsområden: Generativ AI för e-postautomatisering, en e-handelswebbplats, API-baserad fakturering och en AI-agent integrerad i webbplatsen. Huvudmålet var att minska manuella uppgifter, spara resurser och förbättra kundresan. Baserat på processkartläggning, intervjuer med personal och prototyper utvecklades en generaliserbar modell för SMF-digitalisering. Denna iterativa modell består av fyra faser: Kartlägga & Prioritera, Välja & Prototypa, Utvärdera & Validera samt Skala & Förvalta. Ramverket baserades på resultaten från fallstudien och stöddes av teorier som Lean Management, Technology Acceptance Model (TAM) och Resource-Based View (RBV). Digitaliseringen ledde till minskad administrativ tid, resursbesparingar och mer enhetliga kundinteraktioner. Resultaten visar att resurssvaga SMF kan uppnå digital transformation med hjälp av tillgänglig teknik. Genom att ta insikter från fallstudien till en struktur bidrar detta projekt med en plan för SMF-digitalisering samt en reflektion kring dess påverkan på hållbarhet.

Index Terms— API Integration, Customer Experience, E-commerce Platforms, Generative AI, Lean Management, Order Management, Process Automation, SME Digitalization, Sustainable Business Practices, Technology Adoption.

I. INTRODUCTION

AS digitalization and artificial intelligence have become increasingly accessible to small and medium-sized enterprises, new opportunities arise to streamline administrative workflows and improve operational efficiency (Brynjolfsson, 2014). At the same time, smaller businesses face resource constraints that limit their ability to implement complex technological solutions (Sudirman, 2025). This study investigates how digitalization can be integrated into existing small and medium-sized enterprises (SMEs) to reduce manual administrative work, improve customer experience, and support sustainable business development. To make the research more tangible, this paper takes the shape of a case study (Yin, 2018). The case study is Sopköket (translates to “waste-kitchen”), a Swedish catering company with high focus on sustainability (Sopköket, 2025). In Sopköket’s workflows, digital technologies will be deployed to replace or effectivize activities such as manual order management, invoicing, and customer communication. This aligns with research showing that automation and data integration significantly enhance operational efficiency, particularly when supported by broader digital transformation initiatives (Atieh, 2025).

Although this thesis is conducted in collaboration with Sopköket and uses their business as a reference point, its purpose extends beyond addressing the needs of a single organization. The primary aim is to explore how digitalization can be structured, implemented, and evaluated in a practical, real-world context. By breaking digitalization down into four distinct but interconnected sub-areas, this work seeks to create a model for understanding and applying digital transformation into SMEs.

Sopköket provides a valuable context for testing these ideas, but the insights gained, and the methods developed are designed to be generalizable. Many businesses, particularly smaller ones, face similar challenges when it comes to embracing digital tools in a structured and sustainable way. This thesis is therefore positioned not as a consultancy report, but as a contribution to

the broader discussion on how digitalization can be made more accessible, strategic, and effective. The goal is to provide insights, frameworks, and reflections that can inform and inspire other SMEs on their path toward digital transformation.

A. Background and Goals

The case-study client for this project is Sopköket, a Swedish, prize-winning catering company focused on reducing food waste by cooking meals from surplus food sourced from stores, farmers, and wholesalers (88,673kg saved food so far. They primarily provide catering services to businesses but also cater consumer-facing events. Sopköket also works to provide job opportunities for people from marginalized backgrounds (4 full time positions so far), aligning with social entrepreneurship models (Porter & Kramer, 2011). Furthermore, they actively donate meals to people in need (55,886 meals so far). Since the business has a significant number of administrative tasks, Sopköket aims to digitalize these processes to focus more on its core mission: reducing food waste and providing meals to those in need. Digitalizing these administrative processes will also help optimize the customer journey and increase the business's efficiency (Dragana Radicic, 2023).

The goal of this thesis is to use Sopköket as a case study to gain insights about how digitalizing manual workload can save time and resources and offer a better customer experience. The work will also investigate how this digitalization contributes to sustainability goals and what societal effects this will have (Zulfiqar, 2023).

The ethics of this work lies in its focus on digitalization can contribute to societal goals such as saving food, reducing hunger and increasing social responsibility by providing jobs for people from marginalized backgrounds (Porter & Kramer, 2011) (United Nations, 2023).

The final work will be of interest to people in areas such as sustainable business development, digitalization, and small business solutions. For SMEs, this thesis will offer insights on how digitalization can be implemented and its effects on efficiency and societal benefits (Teece, 2010). The thesis will also provide practical recommendations for implementing digital tools and solutions, making it relevant for businesses looking to optimize their administrative processes while contributing to sustainable development (Peng, o.a., 2023).

The work is linked to several global development goals, particularly Goal 12 on responsible consumption and production (United Nations, 2023).

B. Research Question

How can small and medium-sized enterprises use digitalization, with tools such as Generative AI and e-commerce, to reduce administrative workload, improve efficiency, and enhance the customer journey? A case study of Sopköket.

The task involves identifying, prioritizing and digitalizing administrative tasks within Sopköket, and to then generalize this. Examples of common processes with potential are order

handling, invoicing, and customer communication. One challenge will be which digital solutions to focus on and how to measure the impact of these changes on both workload and customer experience (Goh, 2023). The project will consider the integration of digital tools like AI chatbots, automated email responses, and API connections to accounting software like Fortnox (Kedi, 2024) (Zapier, 2025). To address the overarching thesis question, digitalization of SMEs, 4 sub-areas will be used to guide the investigation. The first layer is labeled Primary because it contains the core initiatives that directly drive the overall goal of digitalizing Sopköket. In other words, Gen AI email automation and the new website are the main streams of work you must deliver first.

The other components in the Integrations layer exist primarily to support and enhance these two primary efforts. So, in detail these sub-areas are as follows: In the *primary layer*, generative AI will be used to support email communication with customers. Parallel on the same layer a new website will be planned and developed. Implemented on the website there will be an *integration layer* consisting of two more areas to digitalize. Firstly, a website AI agent to guide customers throughout their purchasing journey and secondly, a solution using API integration with Fortnox to automate invoicing. An overview of the targeted digital transformation for Sopköket is illustrated in Fig. 1, highlighting both primary automation efforts and planned integrations.

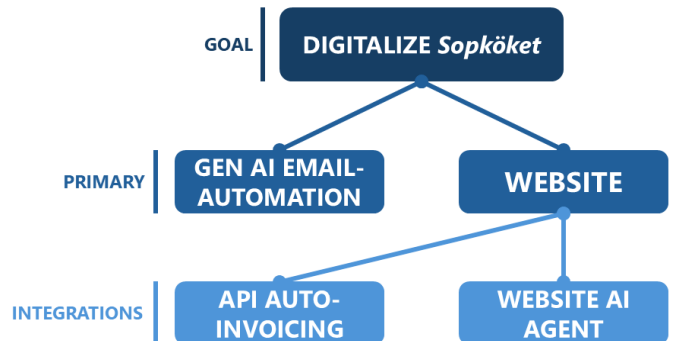


Fig. 1. Overview of the digitalization goals and components for Sopköket. The structure outlines primary focus areas (email automation and website) and associated integrations for the website (API invoicing and AI website agent).

C. Thesis Outline

The research is structured around four sub-areas, each representing a distinct aspect of digital transformation. These sub-areas have been selected to reflect the diverse nature of digitalization in modern industry. To give each component the attention it requires, every sub-area is treated separately with its own methodology and results. However, the final understanding of digitalization for SMEs emerges not from the individual parts alone, but from how they function together.

The methodology chapter explains the overall research approach and how each of the four sub-areas has been studied. While the areas are interconnected, they differ in character, requiring specific methods and tools for data collection and analysis. The results are presented in a similar manner, with each sub-area being treated individually.

The discussion chapter follows, where the combined results are interpreted and reflected upon in a broader context. Here, conclusions about methods and frameworks for digitalization SMEs are presented based on all insights gained from the research.

II. PREVIOUS STUDIES

In recent years, there has been a growing interest in how digital transformation can enhance the efficiency of administrative processes within SMEs, particularly by reducing manual workloads and improving customer experience. One study examined the ongoing digital transformation within the restaurant industry, emphasizing how digital services are reshaping products, processes, and business models (Alt, 2021). The research highlights the potential of digital tools, such as online platforms and automated systems. It is presented that these tools can streamline operations and enable businesses to deliver more responsive and personalized services. These findings reinforce the view that digitalization is essential for modernizing SMEs and that it aligns with the evolving expectations of customers in an increasingly digital economy.

While the benefits of digitalization in the catering industry are evident, SMEs still face challenges when adopting digital tools. These include limited financial resources, gaps in digital competencies among management, and resistance to organizational change. Despite these obstacles, the long-term advantages, such as increased efficiency and improved customer experiences, often outweigh the initial difficulties (Ocloo, Coffie, Bukari, & Bashiru, 2024)

Taken together, these studies highlight the impact that digital tools can have on SMEs, specifically in catering businesses. They show that digitalizing processes not only reduce workloads but also improve the customer journey. However, these changes don't come without challenges.

III. THEORY

A. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) suggests that the success of a new technology largely depends on how easy it is to use and how useful people believe it will be (Davis, 1989). In simple terms, people are more likely to adopt new tools if they feel they will make their work easier and improve their performance. For this project, this model helps us understand how the staff at Sopköket and their customers might react to the new digital tools we are planning to implement, like the e-commerce platform and generative AI for email communication. By using this model, we can predict challenges in adoption and create strategies to make the transition easier for both employees and management, ensuring better integration.

B. Resource based view (RBV)

The Resource-Based View (RBV) suggests that a company's success depends on its internal resources, such as technology, skilled staff, and organizational culture (Barney, 1991). For these resources to provide a competitive advantage,

they need to be valuable, rare, and hard for competitors to copy. For Sopköket, this theory helps us understand how adopting digital tools can create an advantage. By integrating automated processes, Sopköket can make better use of its internal resources, like staff time and materials, improving efficiency and responsiveness to customer needs.

C. Lean Management Theory

Lean Management is all about doing more with less (Liker, 2004). It focuses on creating value for customers while reducing waste, whether that's in time, resources, or effort. The goal is to eliminate anything that doesn't directly contribute to customer experience. Continuous improvement, or Kaizen, is a key principle, ensuring that processes are always evaluated and improved. For Sopköket, Lean Management will be used to understand how digital tools can help improve operations. By applying Lean thinking, Sopköket can identify parts of their workflows that are slow or complicated. Digitalization can help eliminate these inefficiencies, allowing the team to focus on what really matters: serving customers and reducing food waste.

D. Service-Dominant Logic (SDL)

Finally, Service-Dominant Logic (SDL) challenges the traditional business model (Vargo & Lusch, 2004). Instead of focusing on the exchange of products, SDL highlights the importance of services and customer relationships in creating value. In this approach, the business does not just deliver products but works with customers to co-create value. For Sopköket, SDL is especially relevant. As a catering business focused on sustainability and serving the community, Sopköket thrives on customer relationships. By using digital tools to improve interactions the company can create a more efficient service experience. Digitalization allows Sopköket to not only improve its internal processes but also offer a more seamless customer journey, strengthening the relationship with its customers.

E. Digitalization and Artificial Intelligence in SMEs

Digitalization refers to the adoption of digital technologies to improve business processes, efficiency, and customer interactions. In SMEs, digital transformation often focuses on automating manual workflows, improving communication, and enhancing data quality. It plays a crucial role in enabling businesses to scale and adapt to changing market demands (Morteza Ghobakhloo, 2021).

AI technologies, particularly Generative AI like ChatGPT, are becoming increasingly accessible to SMEs and can transform administrative workflows. By deploying AI tools in communication and order management, businesses can ensure faster response times, consistent customer engagement, and improved accuracy in operations (Associated Press, 2024).

Importantly, digitalization is not just a tool for efficiency, it is also a strategic asset. SMEs that integrate digital capabilities into their core operations gain strategic flexibility and resilience (Teece, 2010). AI technologies further amplify this

by enabling predictive analytics, decision automation, and personalized customer experiences (Brynjolfsson, 2014).

F. Societal Impact and Sustainability through Digitalization

Digitalization also aligns with broader sustainability and social goals: One study argues, in their Shared Value framework, that integrating business strategy with societal needs can generate both economic and social value (Porter & Kramer, 2011). For Sopköket, digitalization directly supports Sustainable Development Goal 12: Responsible Consumption and Production (United Nations, 2023), by enabling more efficient use of food resources and expanding the company's capacity to serve vulnerable populations.

Another study found that SMEs that adopted digital supply chain tools were able to reduce food waste, lower environmental footprints, and improve resource allocation (Raheem Bux Soomro, 2024).

G. Challenges and Considerations in Implementation

While the benefits of digitalization are compelling, SMEs often face barriers such as limited financial resources, lack of technical expertise, and resistance to change. Successful implementation requires changed management strategies, staff training, and sometimes external support (Omowole, 2024).

The TAM-model is useful for understanding how employees and stakeholders might respond to new tools (Davis, 1989). Ensuring perceived ease of use and usefulness are important to adoption. Likewise, small prototypes and feedback loops can help reduce friction and increase interest from stakeholders.

IV. METHOD

A. Method Overview

The method used in this project followed a structured and iterative approach. It began with interviews with personnel at Sopköket to understand the existing administrative challenges and gather contextual insights. Based on these interviews, we mapped out current workflows to identify inefficiencies and repetitive tasks. This mapping formed the foundation for a brainstorming phase, where potential digital solutions were explored and evaluated. The most promising ideas, selected based on their potential impact and feasibility, were chosen for implementation. In this case, we proceeded with four targeted digitalization solutions: Generative AI for email automation, an e-commerce website, API-based invoicing, and a website-integrated AI agent. The sections below explain each part in more detail.

B. Data Collection

Stakeholders within Sopköket, including Filip Lundin (Founder and CEO), Danilo Mariano (Head Chef), Petra Lundqvist (Finance Manager), and Louise Krahm (Email & Social Media Manager), will be interviewed to map out the current administrative workflows. These interviews will focus on identifying areas where digitalization could improve efficiency.

Administrative tasks such as order management, invoicing, and communication (email, SMS) will be noted. Observations of daily workplace activities will also be used to identify areas for improvement.

The collected data will be analyzed to identify repetitive tasks that could benefit from automation, such as automatic invoicing, emails, or cost estimations.

The study will also benchmark different digital solutions for specific administrative processes. For example, looking at solutions for e-commerce and AI-powered email response systems and choosing the best fit for Sopköket.

C. Validation

Based on the findings from the interviews and workflow analysis, digital tools will be selected or developed. Once initial digital solutions are implemented, short prototypes tests will be conducted to assess performance. The focus will be on measuring improvements in efficiency, reduction in manual labor, and impact on customer experience. The time saved through automation will be quantified, focusing on metrics like reduction in hours spent on administrative tasks, accuracy, and improvements in customer satisfaction.

D. Expected Results

The expected outcome is an understanding of how SMEs can leverage digitalization to reduce administrative workload, increase efficiency and improve the customer journey. The research will also provide a framework for Sopköket and similar businesses for how to approach digitalization. It is expected that the digitalization of Sopköket will result in benefits, including a reduction in the manual work required for sales and customer communication, while also enhancing the customer experience.

E. Generative AI for Email Automation

To support Sopköket's digitalization goals, a set of ChatGPT-powered projects were developed to automate and streamline various administrative and communication tasks. Each project corresponds to a specific functional area, such as email handling, marketing, pricing, and contracts, where generative AI can provide value. For this case study ChatGPT was used, but there are many other options. What option is best depends on the needs of the SME, since different businesses have different goals, technical skills, and ways of working. Some need simple tools, while others may need more advanced features like system integrations (Širec, Piroška Štrukelj, & Kovač, 2022). For Sopköket, text generation with business and customer context was the primary task, hence ChatGPT was the best option (Upwork, 2023). As illustrated in Fig. 2, these primary areas were further connected to subdomains including sales, food waste tracking, social media, and SEO optimization.

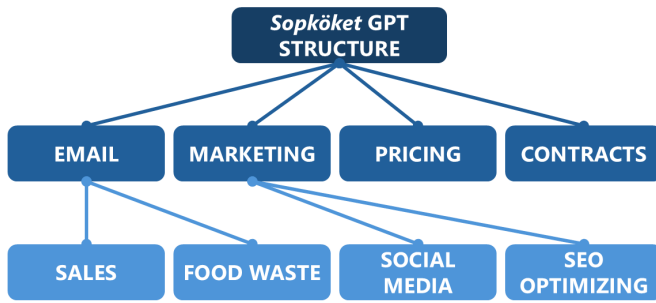


Fig. 2. Structure of the Sopköket GPT implementation. The AI agent is organized to support tasks across communication, marketing, pricing, and contract handling, with additional applications in sales, food waste tracking, social media, and SEO optimization.

As mentioned, the digitalization initiative included several AI-driven subprojects, each mapped to a specific administrative function at Sopköket, such as email, marketing, pricing, contracts. While these parallel projects were designed and initiated, email automation was prioritized as the focus area for implementation due to its clear potential for measurable impact. This decision was guided by a qualitative prioritization framework, inspired by the RICE model, which evaluates tasks based on Reach, Impact, Confidence, and Effort, allowing us to prioritize initiatives that deliver high customer value with reasonable implementation cost (Atlassian, 2023).

Through interviews with Sopköket and analysis of historical workflow data, it became evident that handling customer emails was among the most repetitive and time-intensive tasks. The manual nature of this communication, often requiring multiple back-and-forth exchanges to finalize orders, required heavy administrative resources. Furthermore, since email interaction is the customer's first point of contact with the business, optimizing this area will enhance the overall customer experience (Thomas, Chen, & Iacobucci, 2022).

ChatGPT was therefore configured to automate customer emails using historical email data and prompt instructions. This setup ensured that automated replies remained aligned with Sopköket's voice and values, while delivering accurate information. To improve customer experience further, the system was linked to internal Excel-based calculators to automatically include personalized data for the customer's purchase. This included CO₂ savings and donated meals.

To quantify the economic impact of AI-supported automation in customer communication, we applied a time-driven cost estimation approach based on observed time savings per customer. This approach draws on core principles from Time-Driven Activity-Based Costing (TDABC), specifically the use of time estimates for specific tasks and applying a cost-per-time-unit rate to calculate resource use and cost savings (Kaplan, 2004). The numbers used in the calculations are based on interviews and data from Sopköket.

The data showed approximately 30 catering events per month, which, for an average month, translate to 30 unique customers. Out of these 30, about 20% or 6, are complex orders such as dinners or parties, which take more time to process. The rest, 80% or 24, are simple orders such as lunch wraps coffee meetings, and require less time to schedule.

Interviews and past customer interactions revealed that, on average, each complex order required 5-6 back-and-forth

email interactions and each simple order around 2-3 emails before finalizing a sale. Further interviews indicated that, before implementing ChatGPT, each complex order total customer email interaction took approximately 60 minutes of administrative time, and each simple total order customer email interaction took about 20 minutes.

After the automation was implemented, this time was for complex orders reduced to about 20 minutes, savings of roughly 40 minutes per customer, and for simple orders reduced to 5 minutes, saving about 15 minutes per customer. By combining this time reduction with the average number of customers per month, we estimated total time and labor cost savings. Using Sopköket's data (6 complex orders + 24 simple orders) and an average hourly administrative wage in Sweden of 200 SEK (Economic Research Institute (ERI), 2025), we calculated both monthly and annual cost savings attributable to the automation. As shown in Table I, the implementation of ChatGPT automation leads to an estimated annual cost saving of 9 600 SEK through reduced administrative time. However, we expect real time savings from GPT-powered email automation to exceed our conservative estimates. Emailing isn't limited to complex orders, some simple bookings still generate inbox exchanges, and activities like coordinating meal donations, networking and scheduling pickups all rely on email. Lacking precise data for these additional messages, we chose to anchor our calculations at the lower bound. GPT-driven email support probably frees up more staff time than reported.

TABLE 1
ESTIMATED COST SAVINGS FROM AI-SUPPORTED
EMAIL AUTOMATION

Metric	Value
Complex customers per month	6
Time saved per customer (minutes)	40
Total time saved per month (hrs)	4
Hourly labor cost (SEK)	200
Monthly cost savings (SEK)	800
Annual cost saving (SEK)	9600

This analysis is supported by theoretical models such as the RBV, which emphasizes the strategic value of internal resources like time and employee capacity, and Lean Management, which focuses on eliminating wasteful or repetitive processes (Barney, 1991) (Liker, 2004). By automating standard customer interactions, the AI system reduces manual workload, thereby enhancing operational efficiency and contributing to value creation within SMEs.

F. Website

After meetings with Sopköket's team, an analysis of the old website mapped the customer journey. The site only listed the weekly menu and sent orders through a Google Form; staff then copied the data into a spreadsheet, drafted an invoice in Fortnox, and emailed a confirmation. To remove this duplication the site was replaced. The new solution offers an online cart so customers can add items, leave, and return to

edit them. At the checkout they choose the catering date, and a calendar shows already booked days in gray, preventing impossible requests. When an order arrives, the system emails a summary to Sopköket, where a staff member checks capacity and allergens; only after approval does the platform call the Fortnox REST API to create the invoice. Two weeks before the catering date the system sends reminder emails and texts warning that the change window is closing, lowering late modifications. An AI chat agent is available outside office hours to answer questions and collect order details. Both the automated Fortnox invoicing and the AI agent are detailed in later method subsections; this section focuses only on the website flow (KTH, DH1623).

The site is built on WooCommerce, an open-source plugin that turns any WordPress installation into a full-e-commerce store. WooCommerce provides ready-made modules for product catalogues, carts, checkout, tax rules, and transactional emails, all configurable through a web interface that staff can use without coding. At the same time, it exposes a hook system and a REST API, which allow custom functions such as the Fortnox integration and reminder logic. WooCommerce thus supplies a low-code foundation that meets Sopköket's goals for usability and efficiency.

G. Website AI agent

To reduce repetitive inquiries and enhance the digital customer journey at Sopköket, a website-integrated AI chatbot was developed and deployed within the newly implemented WooCommerce platform. The AI agent was designed to operate outside business hours and provide instant support on common topics such as menu options, booking availability, dietary restrictions, delivery logistics, and the sustainability impact of orders. Built using a large language model API (e.g., ChatGPT), the chatbot was configured with tailored prompts to match Sopköket's values and embedded into the site via a front-end widget.

H. API – Automatic Invoicing

WooCommerce is built in PHP, so the automation is implemented as a lightweight PHP plugin. PHP is a widely used programming language for web development, especially for building dynamic websites like WordPress. When checkout completes the plugin hooks into `woocommerce_checkout_order_processed`, assigns the new order the status Pending review, and emails a compact summary; product lines, quantities, prices, VAT, customer data, catering date, allergen notes to the catering inbox. The email contains two signed links, Accept and Reject, each carrying a JSON Web Token (order ID + timestamp + server secret) so it cannot be forged.

A staff member reviews the message against kitchen capacity. Clicking Accept opens a confirmation page that logs the staffer's address and calls `wc_update_order_status($order_id, 'approved')`. That status change fires the plugin's second hook. The same PHP class now gathers the order rows, maps them to the Fortnox invoice schema, and authenticates Fortnox via OAuth 2 client credentials stored as environment variables. It then sends a single POST `/v3/invoices` request.

Fortnox returns an invoice number and PDF link; these are saved in order metadata, the PDF is downloaded to the media library, and WooCommerce emails the customer a final confirmation with the invoice attached.

If Fortnox responds with an error the plugin flags the order Invoice error, stores the payload and HTTP code in a log table, and notifies finance so the issue can be fixed before the catering date. Clicking Reject instead sets the status Cancelled and emails the customer suggested alternative dates. This email-based approval step preserves a human feasibility check, while the PHP plugin removes manual data entry and guarantees that every accepted booking is matched to a Fortnox invoice, closing the gap between online order and accounting ledger.

I. Additional cost estimations

To remove the recurring manual pricing of optional services (e.g., cutlery hire or on-site staff), every order that includes add-ons is now logged in a shared Excel sheet with date, menu type, guest count, base food cost and invoiced add-on cost; the sheet calculates each add-on's surcharge as a percentage of the food price and, via pivot-table formulas, keeps a running mean that Shopify applies automatically when a customer selects the option, while staff can override it until the estimate stabilizes; during an eight-week pilot the surcharge converged to $\approx 15\%$ for cutlery rental and $\approx 30\%$ for service staff for a 50-guest event, cutting manual quotation time by about five minutes per order and keeping automated prices within $\pm 5\%$ of fully costed spot-checks.

V. RESULTS

A. SME Digitalization Framework

Based on the case study of Sopköket and the outcomes of each implemented subproject, a general framework for SME digitalization was developed. The purpose of this framework is to provide a repeatable, flexible process that small businesses can use to evaluate, implement, and sustain digital transformation efforts. It is informed by both practical outcomes and theoretical models such as Lean Management, TAM, and the Resource-Based View. The framework outlines four iterative phases: Diagnose & Prioritize, Select & Prototype, Evaluate & Validate, and Scale & Sustain, that together form a continuous cycle of digital improvement. An overview of this framework is presented in Fig. 3 below.

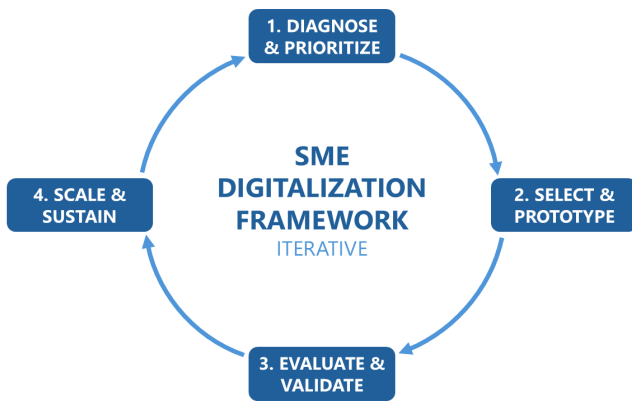


Fig. 3. SME Digitalization Framework. Our model illustrates an iterative four-step process for digital transformation in small and medium-sized enterprises, starting with diagnosis and prioritization of needs, followed by solution prototyping, evaluation, and eventual scaling. The cycle is designed to repeat, to capture the ever-evolving technology.

While the SME Digitalization Framework provides a high-level model for structuring digital transformation, its development was grounded in the practical implementation and evaluation of specific solutions at Sopköket. To validate each stage of the framework, four digitalization subprojects were prioritized and executed: email automation using Generative AI, development of an e-commerce website, implementation of an API-based invoicing system, and deployment of an AI website agent. The following sections present the results from each of these subareas, highlighting the measurable impacts, challenges encountered, and learnings that informed the overall framework.

B. Website Design

The redesigned Sopköket website was evaluated using the MDI course rubric from KTH (DH1623), where MDI stands for "Människa–Datorinteraktion" (Human–Computer Interaction). It focuses on designing digital systems that are easy to use, efficient, and adapted to human needs and behavior. More specifically it evaluates a design in three dimensions: strategic alignment, interface usability and visual design, on a 1–5 scale. The three criteria are: Strategic alignment, which measures how clearly the site's content and features support Sopköket's business goals and mission, interface usability, which measures how easily users can navigate, find information and complete tasks and visual design, which evaluates the site's aesthetic quality, brand consistency and overall look and feel.

As shown in figure 4, the original site scores were 4 for strategic alignment, 3 for interface usability and 3 for visual design. After the redesign, these increased to 5 for strategic alignment, 4 for interface usability and 4 for visual design, demonstrating a stronger alignment with business goals, a more intuitive user flow and an improved aesthetic.

Using the scores which went from a total of 9 to 13, an increase of around 40%, we estimate a 20% percent uplift in monthly visits following the launch of the new website. At Sopköket's traffic levels this translates into roughly 200 additional sessions per month and, with the existing 3.3

percent conversion rate, results in an extra five to seven orders each month.

These findings confirm that grounding the website overhaul in the MDI evaluation framework increased Sopköket's digital maturity across different areas and delivered business impact, completing the Select & Prototype and Evaluate & Validate phases of our SME Digitalization Framework and setting the stage for Scale & Sustain. A visualization of these findings is presented in Fig. 4 below.

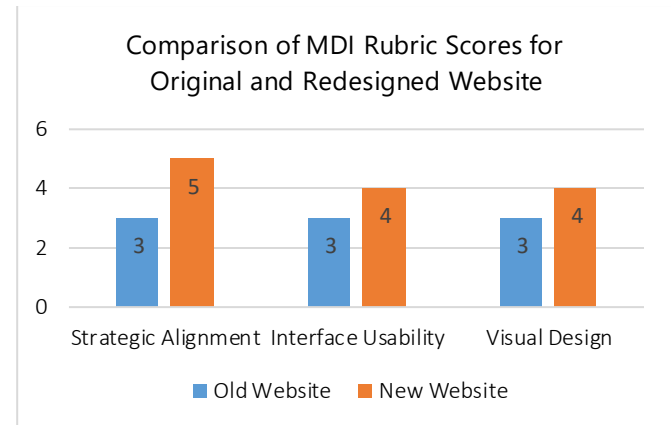


Fig. 4. Comparison of MDI rubric scores across three dimensions for the original (blue) and redesigned (orange) Sopköket website, showing an increase in strategic alignment from 3 to 5 and in both interface usability and visual design from 3 to 4.

C. Gen AI Email Automation

The implementation of AI-supported communication processes at Sopköket led to an improvement in operational efficiency and customer satisfaction. Customer emails, which previously required more manual handling, were now answered more consistently and faster, which was confirmed by customer ratings.

Following the implementation of Gen AI email automation at Sopköket, improvements in operational efficiency were observed. On average, this new system reduced the number of email interactions per customer by 2–3, which equals to approximately 40 minutes per customer. This reduction comes mainly by eliminating repetitive queries and remembering customer context. Given that Sopköket serves about 30 customers per month and around 20 percent (six) of those require complex back and forth email exchanges, this automation frees up ~4 hours of staff time each month.

Applying an estimated labor cost of 200 SEK per hour, based on median salaries of administrative workers in Sweden (Economic Research Institute (ERI), 2025), the automation generates direct administrative cost savings of approximately 800 SEK per month, or 9,600 SEK annually. While it might seem small in absolute financial terms, it is significant given the small scale of operations. More importantly, it allows staff, particularly the founder, to redirect time toward value-creating activities such as food rescue logistics and social initiatives. These outcomes align with both Lean Management and the RBV. The savings are visualized in Fig. 5 below.

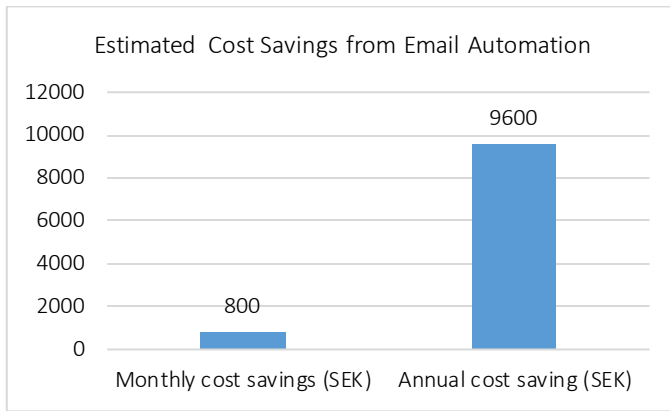


Fig. 5. Estimated cost savings from email automation: ~800 SEK per month and ~9,600 SEK per year.

Moreover, the integration of real-time calculations regarding CO₂ savings and meal donations into customer interactions added a unique and meaningful dimension to the customer experience. Customers received instant feedback about the positive environmental and social impacts of their orders, enhancing their engagement and reinforcing Sopköket's sustainability mission.

D. Website AI agent

The deployment of an AI powered conversational agent on Sopkökets e-commerce site, built using GPT API, makes it possible to handle the existing volume of 30 orders per month without overwhelming administrative work. Of those 30 orders, 80 % (approximately 24) are simpler bulk bookings that normally require no back-and-forth emails. During testing we found that half of these straightforward orders, 12 per month, can be completed via the standard self-service shopping cart requiring no extra help. The other 12 must be handled by the AI chatbot since customers get stuck and ask for help. Since their issues are simple, the chatbot can resolve them without customers needing to take further contact via email. Because each of those 12 chatbot-handled orders saves about 15 minutes of manual processing time, not 40 minutes as complex ones, the AI agent saves approximately 3 hours of staff work every month. At a labor rate of 200 SEK per hour (Economic Research Institute (ERI), 2025) this corresponds to roughly 600 SEK in monthly administrative cost savings (approximately 7,200 SEK annually). These results demonstrate how a website AI agent can deliver both hard ROI through targeted time and cost savings and soft ROI by boosting customer satisfaction and reinforcing Sopkökets sustainability mission thereby validating the Select and Prototype and Evaluate and Validate phases of our SME Digitalization Framework and laying the groundwork for the Scale and Sustain stage. The savings are visualized in Fig. 6 below.

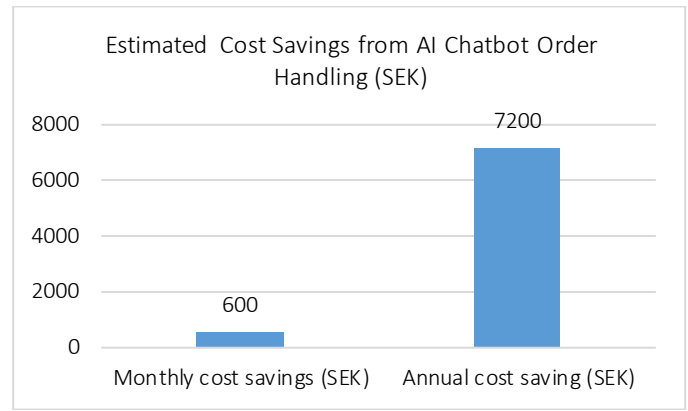


Fig. 6. Estimated cost savings from AI chatbot order handling: ~600 SEK per month and ~7,200 SEK per year.

E. API - Automatic Invoicing

After implementing the API-driven Automatic Invoicing Plugin we saw staff time being saved. Sopköket currently handles about 30 orders a month, of which roughly 80 percent, 24 orders, are standard bulk bookings that require no special coordination and can therefore be invoiced immediately. This is because the whole ordering process in this case can be done by the customer alone, without contact with staff, either with the cart system, or by going through the AI agent chatbot which leads to a cart order. This integration into Fortnox removes the need for manual data entry at every step, ensuring each invoice is generated correctly and sent out the moment an order is approved. By shaving off approximately 15 minutes per invoice we can save about 7.5 hours of administrative time every month. At a labor rate of 200 SEK/hour, that translates to roughly 1,500 SEK in monthly savings, or about 18,000 SEK annually. This is visualized in Fig. 7 below.

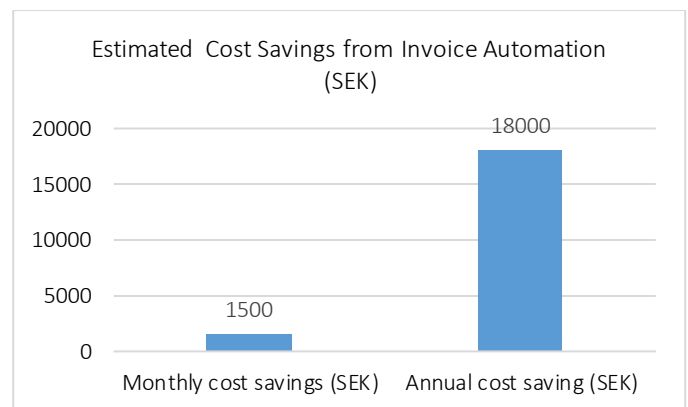


Fig. 7. Estimated cost savings from invoice automation: ~1,500 SEK per month and ~18,000 SEK per year.

By stripping out these repetitive bookkeeping tasks, the team can devote more time to donate food, deepening customer relationships and expanding Sopköket's social initiatives, outcomes that Lean Management and the RBV both recognize as high value.

VI. DISCUSSION

A. From Case to Framework: Creating a Digitalization Framework for SMEs

One outcome of this thesis is the development of a practical, iterative framework for digitalizing administrative processes SMEs. This framework was based in the four digitalization initiatives at Sopköket: Generative AI for email automation, a new e-commerce website, automatic API-based invoicing, and a website-integrated AI agent. This formed the foundation of the four-stage SME Digitalization Framework: Diagnose & Prioritize, Select & Prototype, Evaluate & Validate, and Scale & Sustain.

The first stage, **Diagnose & Prioritize**, was grounded in interviews at Sopköket. These interviews revealed several repetitive, manual tasks that took lots of time but contributed little to value creation. Using RICE logic for prioritization, email workflow stood out as a clear candidate for automation, occurring in nearly every customer interaction and requiring manual input. This phase demonstrated the importance of business context, particularly for SMEs with limited resources. Without a clear understanding of internal bottlenecks and their impact, digital tools risk being misapplied.

The second stage, **Select & Prototype**, involved choosing the right technology for the task. While numerous AI and automation platforms exist, the choice of ChatGPT for email handling was based on its ability to generate context-aware responses whilst also being easy to use. This decision aligns with existing literature emphasizing the importance of perceived usefulness and ease of use in technology adoption (Davis, 1989). For invoicing, the Fortnox API was selected for its compatibility with existing accounting systems. WooCommerce was chosen as the website base because of its balance between ease of use and technical flexibility. This stage was not only about technical selection but also about finding tools that matched Sopköket's scale, capabilities, and existing systems.

The third stage, **Evaluate & Validate**, was operationalized through pilot testing. Each solution was tested in production with live orders or customer interactions and monitored using both quantitative (e.g., time saved, cost reduction) and qualitative metrics (e.g., team feedback, perceived clarity of the process). For instance, the Gen AI email automation was estimated to save roughly 40 or 15 minutes per customer, resulting in SEK 800 in monthly administrative savings. Beyond cost metrics, staff interviews indicated that they felt less cognitively overloaded, particularly with repetitive tasks. Similarly, the automatic invoicing plugin was found to eliminate manual steps while improving data accuracy.

The fourth and final stage, **Scale & Sustain**, emphasized that successful digital tools must be maintained, improved, and possibly extended. At Sopköket, the email automation system was expanded to include contextual sustainability data (e.g., CO₂ savings, meal donations) in replies. This increased customer engagement while reinforcing brand values. The process also reinforced the importance of user training and feedback for sustainability, aligning with the TAM model's focus on user perception and the Lean Management principle of continuous improvement.

B. Theoretical Reflections and Alignment

The framework developed through this project aligns with several established theoretical models, offering both validation and opportunities for extension. The Technology Acceptance Model (TAM) played a central role in anticipating adoption challenges. By focusing on ease of use and perceived value during tool selection, resistance to change was minimized, particularly in a resource-constrained SME setting where every tool introduced must be intuitively valuable. The framework's emphasis on piloting and feedback mechanisms corresponds directly with the TAM model's recommendation to test and tailor solutions for the users.

The Resource-Based View (RBV) helps explain why digital tools can become long-term strategic assets for SMEs. At Sopköket, automation of communication and invoicing did not just save time, but it also freed up strategic attention. Resources, especially time and decision-making bandwidth, were reallocated to high-value activities like partnership building and food rescue logistics. These reallocated internal capabilities are both valuable and hard to imitate, fulfilling RBV's criteria for sustainable competitive advantage.

Additionally, Lean Management principles are embedded in the framework's iterative nature. By continuously diagnosing bottlenecks and evaluating tool performance, the business moves toward a "do more with less" posture. Eliminating redundant administrative tasks, minimizing manual steps, and reducing customer friction aligns perfectly with Lean thinking. The iterative loop built into the model reflects the Kaizen principle of ongoing process refinement, a crucial fit for SMEs that grow through adaptability rather than scale.

C. Generalizability and Practical Implications

Although the model was developed through a single case study in the catering sector, its logic and structure are transferable to other SMEs. Most SMEs share common constraints: limited technical expertise, small teams, and a need for high operational efficiency. The model's simple approach offers a way to begin digitalization without requiring large capital investments or high levels of IT infrastructure.

To help future SME teams replicate the approach, the core steps of the SME Digitalization Framework are outlined below. Each phase includes conditions for success, practical advice, and expected outcomes. Due to layout constraints, a full tabular version is available in Appendix A.

Diagnose & Prioritize: This phase requires management buy-in and a clear understanding of internal workflows. We recommend conducting structured stakeholder interviews, mapping bottlenecks in administrative processes, and applying a prioritization model such as RICE. The expected outcome is a shortlist of high-impact areas for digitalization that align with both customer needs and internal inefficiencies.

Select & Prototype: With basic IT infrastructure in place, SMEs should select low-complexity, high-reward tools, such as WooCommerce or ChatGPT. Starting small, with only one area at a time, reduces risk and accelerates learning. The goal is to ensure early wins and confirm that chosen solutions match real workflows and user skills.

Evaluate & Validate: This stage relies on access to relevant metrics and feedback loops. Track KPIs like hours

saved, response times, and error rates. Qualitative input from staff and customers should be gathered to assess usability. When successful, tools should demonstrate both operational improvements and stronger stakeholder confidence.

Scale & Sustain: Sustained value requires that digital tools have clear owners, updated documentation, and integration into daily routines. SMEs should train staff to manage small updates and gradually refine automation flows (e.g., via prompt tuning or API adjustments). This supports long-term adaptability and organizational learning.

D. Limitations and Further Research

This framework, while practical and evidence-based, is not without limitations. It is built from a single-case context, and its generalizability must be tested across different industries, company sizes, and organizational cultures. Moreover, certain digitalization areas, such as cybersecurity, data analytics, or internal HR systems, were not explored in depth. Future research could extend the framework by applying it in other domains, particularly in non-customer-facing processes or manufacturing SMEs.

Additionally, while the model assumes a certain level of digital readiness (e.g., existing IT infrastructure), some SMEs may lack even these basics. Adapting the framework for digital late adopters would be a valuable contribution to the research.

E. Conclusions and Recommendations

The Sopköket case demonstrates that by mapping its order to payment, invoicing and customer communication workflows the company identified its most labour-intensive tasks and automated them with an e-commerce platform, AI email responders and cloud accounting, which reduced manual work, cut errors and allowed staff to focus on customer relations, community engagement and higher volume. This method can be applied to other small or medium-sized enterprises: begin with an analysis of existing processes, select user friendly tools that integrate easily with current systems, introduce them one at a time while gathering feedback, and track metrics such as time saved, error reduction and customer satisfaction to establish return on investment. By aligning digitalization with its circular economy mission Sopköket also shows how technology can advance social and environmental goals. From a theoretical perspective these digital assets function as strategic resources that eliminate administrative waste and foster continuous improvement. Although the findings come from a Stockholm-based catering firm, further studies in other industries and regions are needed to confirm the broader applicability of this blueprint.

VII. APPENDIX

A. Appendix A - Implementation Table for SME Digitalization

This appendix provides an expanded summary of the requirements, recommendations, and expected outcomes for each phase of the SME Digitalization Framework. The table is intended as a planning tool for other SMEs aiming to apply similar methods.

TABLE 2
IMPLEMENTATION TABLE FOR SME DIGITALIZATION

Framework Phase	Requirements	Recommendations	Expected Outcomes
1. Diagnose & Prioritize	<ul style="list-style-type: none"> -Management commitment -Understanding of workflows 	<ul style="list-style-type: none"> -Conduct interviews with staff -Map manual tasks and inefficiencies -Use RICE or similar method to prioritize initiatives 	<ul style="list-style-type: none"> -Clear target areas for digitalization -Strategic focus on high-impact changes
2. Select & Prototype	<ul style="list-style-type: none"> -Basic IT infrastructure -Openness to experimentation 	<ul style="list-style-type: none"> -Choose low barrier, widely supported tools (e.g., ChatGPT, WooCommerce) -Start small with one high-value process 	<ul style="list-style-type: none"> -Early proof-of-concept -Tools selected to fit staff capability and organization size
3. Evaluate & Validate	<ul style="list-style-type: none"> -Access to data and staff feedback 	<ul style="list-style-type: none"> -Track time savings, error rates, satisfaction -Use qualitative interviews and quantitative KPIs 	<ul style="list-style-type: none"> -Confirmed impact and usability -Increased stakeholder buy-in
4. Scale & Sustain	<ul style="list-style-type: none"> -Ownership of tools -Willingness to document and iterate 	<ul style="list-style-type: none"> -Assign tool owners -Update prompts and automation logic regularly -Train staff to maintain or expand solutions 	<ul style="list-style-type: none"> -Sustainable efficiency gains -Long-term alignment with business processes

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