GLOBAL ACADEMIC RESEARCH INSTITUTE

PONTA DELGADA, PORTUGAL | COLOMBO, SRI LANKA



GARI International Journal of Multidisciplinary Research

ISSN 2659-2193

Volume: 12 | Issue: 03

On 30th September 2026

http://www.research.lk

Author: Rico Swanepoe, Daniel Schutte, Ralf-Christian Härting

North-West University, South Africa; University of Applied Sciences Aalen, Germany

GARI Publisher | Artificial Intelligence | Volume: 12 | Issue: 03

Article ID: IN/GARI/ICSSH/SVL/2026/124/JUN | Pages: 27-43 (17)

ISSN 2659-2193 | Edit: GARI Editorial Team

Received: 25.06.2026 | Published: 30.09.2026

DOI:https://doi.org/10.63572/gari1571

CC BY-NC 4.0

EXPLORING AUTOMATED INVOICE PROCESSING: A FOUNDATION FOR AI AUTOMATION

[1]Rico Swanepoe, [2]Daniel Schutte, [3]Ralf-Christian Härting

[1,2]North-West University, Faculty of Economics and Management Sciences,

[3]University of Applied Sciences Aalen,

[1,2]South Africa, [3]Germany

ABSTRACT

Invoice processing in many organisations remains heavily manual despite substantial investment in traditional ERP and accounting systems. Existing studies addresses these issues in isolated elements as opposed to an interconnected problem. This study documents an existing manual invoice process at an international manufacturing company that is composed of many different acquired businesses, establishes the requirements for an automated alternative, and evaluates the suitability of AI-supported automation against traditional ERP customisation. Participant feedback is used to surface the limitations of traditional ERP and accounting systems and to assess whether AI is a suitable alternative or complementary tool. The researchers conducted semi-structured interviews via Microsoft Teams with purposively selected participants. The participants were chosen for their roles and direct involvement in the process being evaluated as well as representing various businesses previously acquired in order to better apply the results to the general population. The interviews established current and ideal workflows and surfaced perceived limitations of traditional ERP and accounting systems. Thematic coding was conducted manually by the researchers using the Microsoft Teams interview transcripts. Traditional systems are perceived as costly, slow to implement, demanding of specialist skills, and difficult to customise to organisation-specific needs. A proposed automated workflow is characterised by high levels of customisation and a reduction in manual process steps relative to the documented manual baseline. Participants viewed AI-supported automation as a promising candidate technology for addressing the limitations of traditional systems, although empirical validation against a working implementation is identified as a necessary next step. Future work should prototype and benchmark the proposed automated workflow through the development of an AI process model and compare the accuracy, skill requirements, and cost against traditional ERP and accounting systems.

Keywords: Artificial intelligence, ERP and accounting systems, customisation, automation

INTRODUCTION

MIT Professor Edward Fredkin once observed that there have been three truly significant events in history: the creation of the universe, the emergence of life, and, more recently, the appearance of artificial intelligence (AI) (Copeland, 2015). Mirbabaie et al. (2021) consider AI to be an integral part of future organisational strategy and decision-making. According to Hameed (2020), AI is the science and engineering related to making intelligent machines and computer programs. These machines and computer programs are used to understand, mimic, and improve human intelligence without relying solely on biologically observable methods

CC BY-NC 4.0

(Hameed, 2020). Rapanyane and Sethole (2020) describe AI as the science that develops intelligent machines that behave as humans would. Since AI has fewer constraints than biologically observed methods, it has become a standard tool for automating or simplifying tasks. AI has increasingly been integrated into organisations to foster collaboration between humans and machines and assist employees with work-related tasks (Mirbabaie et al., 2021). There is, however, anxiety as employees might misperceive that AI is there to replace them; in many instances, solutions are developed to assist employees in being more efficient and focusing on value-adding tasks aligned with their level of expertise (Mirbabaie et al., 2021). Industries using AI worldwide report over three times the revenue per employee and note wages increasing by up to 56% for employees skilled in AI (Govender et al., 2025). South Africa's leading online recruitment platform, Pnet, has noted that the number of AI professionals securing new roles has nearly doubled when comparing Q1:2020 data to Q1:2025 data. Furthermore, demand for AI professionals on this platform has increased by 183% from Q1:2018 to Q1:2024 (Fraser, 2025). AI should therefore be seen as a tool that enhances employee productivity rather than replacing them. According to Agrawal et al. (2019), a long-term trend shows the interdisciplinary synergy between AI, finance, and economics. Therefore, it is no surprise that AI has become a common tool for enhancing traditional digital applications or developing new ones (Song et al., 2025). Liang and Wu (2022) found that the benefits of AI in accounting and finance lie in increased productivity, improved reliability of data, reduced fraud, and agility in adapting to new system requirements. Krieger et al. (2023) found that many companies make use of invoices in PDF format that are uniquely structured and, therefore, proposed the use of AI for invoice capturing.

Recognising the perceived importance of AI, it is worth exploring its use and impact within the accounting and finance industry. This is also emphasised in Figure 1 below,

which indicates how organisations increasingly specify AI as a skill requirement for finance candidates.

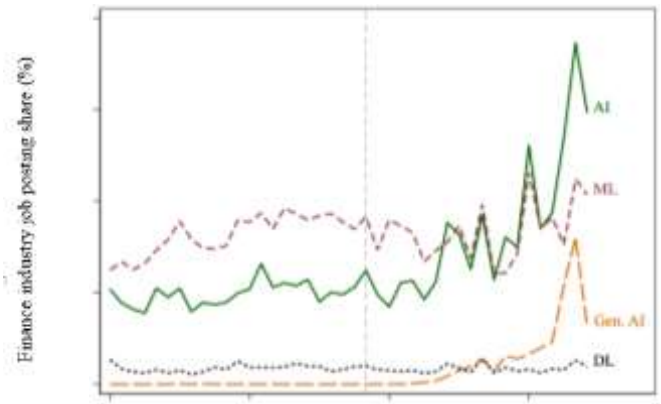


Figure 1: Skill demand in the finance sector
Source: Adapted from Eisfeldt & Schubert (2024)

CC BY-NC 4.0

In recent years, organisations have shown increasing interest in automating accounting and finance processes (Kielanowicz & Wnuk-Pel, 2023). One such financial process found in most organisations is invoice processing (Myers et al., 2015). According to Myers et al. (2015), invoice processing is a common but often unique process that many organisations do manually, causing this process to be prone to data capturing inaccuracies and excessive manual steps. Many companies choose to automate this process, but a challenge arises as traditional digital systems rarely address all the specific requirements without incorporating some form of a custom solution (Arslan, 2022). For the purpose of this study, the researchers define the scope of invoice processing to include the capturing and allocation of supplier invoices as well as the generation of sales invoices, both in a specific format. Supplier invoices must be in PDF format and include all required information to be deemed a valid tax invoice. Sales invoices are uploaded to customer portals, which reject the invoice if the file format is incorrect, if data is missing, or if the data is not captured in the correct format. Kielanowicz and Wnuk-Pel (2023) attribute the growing interest in automating such processes to reducing the time financial experts spend on data preparation and processing. Less time spent on data preparation and processing means financial experts can be used for other, more value-adding activities.

Dragomirescu et al. (2025) found that invoice management is one of the more traditional methods in organisations that is still highly reliant on manual labour, incurs significant cost and delays, and leads to wastage of resources. Organisations process many daily transactions, such as invoices, that can bring insights when thoroughly analysed (Baviskar et al., 2021). This means that when automating this process, the benefits stretch beyond data accuracy and efficiency, as analytics can be performed to provide further insights in gaining a competitive advantage when data is reconstructed in a more structured format.

Traditional digital systems for automating accounting and finance processes include finance and accounting software, integrated IT applications, and Enterprise Resource Planning (ERP) systems (Martinek-Jaguszewska, 2018). Each of the mentioned applications and systems has different levels of functionality when specifically used for automating finance processes. In most instances, they are used in parallel or are integrated with one another. Finance and accounting software such as Sage, Quickbooks, Tally ERP, Xero, and FreshBooks usually focus on general ledger management. This software can also be classified as part of Tier 3 ERP systems, which are typically geared towards addressing core accounting functionalities used in small to medium-sized enterprises with few system integration requirements (Singh, 2006).

Tier 1 ERP systems, on the other hand, include applications such as SAP and Oracle, which provide comprehensive business integration of finance functionalities with all other departments within the business (Singh, 2006). Tier 1 ERP systems are generally implemented in larger organisations with more than one business unit and often operate in multiple geographies. Tier 2 systems, such as Microsoft Dynamics, are primarily used in medium-sized organisations and aim to balance functionality, cost, and adaptability. IT applications include a broader set of technologies, often beyond ERP systems, but can also be integrated into or classified as part of ERP systems in some instances. These can include Internet of Things (IoT) devices, blockchain applications, or AI, among many others.

ERP systems in any of the forms mentioned above are deemed the most popular for implementation within finance functions as they can be rolled out to and

CC BY-NC 4.0

integrated with other functions in the value chain (Akrong et al., 2022). These systems can be costly to implement, require high levels of skill, and are often inherited legacy systems, making customisation difficult. A study by Singh et al. (2023) found that many organisations implementing traditional digital applications, such as ERP systems, could not improve their performance as effectively as anticipated. The study reported that many of the organisations saw a decrease in their profits year after year, coming as a result of reduced agility due to system constraints, high capital investment, and ongoing operational costs associated with post-implementation issues that lasted on average for more than 36 months (Singh et al., 2023). On the other hand, a study showed that 70% of global participants and 81% of South African participants believe that operating profits will increase by at least 3% by 2030 as a result of using AI in operations (Burger, 2025).

Another commonly used application that can be found in some ERP systems as part of automating invoice processing is Electronic Data Interchange (EDI) invoicing, where invoices are exchanged electronically in a specified structure and format (Krieger et al., 2023). EDI simplifies and automates supplier invoice capturing and allocation. It does, however, complicate the generation of sales invoices for those specific suppliers. Since the structure and format must be precise to avoid processing errors, this means that all suppliers need to agree to adopt this approach. In most instances, organisations have many suppliers, and those suppliers are also doing business with multiple other companies. It, therefore, becomes difficult to convince all stakeholders to adopt the rigid system that EDI invoicing brings, as the benefit is typically only to one entity, even though many are impacted. Historically, EDI has not involved AI, but opportunities exist to make use of AI in collaboration with EDI solutions (Baviskar et al., 2021). Considering the above, automating financial processes such as invoice processing in business seems inevitable; however, the extent to which such systems are implemented varies based on the needs and complexities of different organisations. This means there will be an ongoing need for customised solutions due to organisations' unique needs and complexities.

Many traditional digital systems are available to automate financial processes and tasks. These systems are typically costly to implement and take time to roll out. Furthermore, they are rigid by design and require high levels of skill and capital investment to customise to specific organisational needs. ERP systems can automate many processes; however, these processes typically aim to address the primary needs of businesses, such as accounting transactions and logistics management. The need for custom solutions within organisations is on the rise, and many cannot afford the time or cost to adapt and implement traditional digital systems (Singh et al., 2023). A gap in knowledge arises as the existing literature addresses these problems in separate elements as opposed to an integrated problem. Krieger et al. (2023) and Arslan (2022) demonstrate information extraction from invoices, but treat extraction as an isolated technical task rather than a key component to accurately automate invoice processing. Baviskar et al. (2021) and Dragomirescu et al. (2025) establish that invoice management remains manual and costly, but stop short of specifying what an automated alternative would need to achieve. Akrong et al. (2022) and Singh et al. (2023) document the cost, rigidity and post-implementation difficulties of ERP and accounting systems, but do not consider AI as an alternative or complementary tool to address these constraints.

Most organisations' invoice processing workflows are unique, so there will be a

continuous need to develop customised solutions. The dilemma many of these organisations face is balancing the need for automated solutions with the high investment associated with traditional digital systems, leading to many accepting the limitations of manual processes. Unfortunately, this limits their agility and efficiency, ultimately affecting their growth trajectory.

The problem outlined above is approached through the lens of task-technology fit. This theory holds that technology improves performance only where its functionality matches the requirements of the task it supports. A poorly fitting system, therefore, delivers little benefit, even when heavily used (Goodhue & Thompson, 1995). This offers a way to understand why established systems may remain in use even as much of the process remains manual. This study, therefore, aimed to firstly evaluate a manual invoice processing workflow at a group of companies as a baseline, secondly establish the requirements of an automated invoice process, thirdly investigate the challenges faced in the implementation of traditional digital systems, and lastly understand the suitability of the use of AI in financial processes. Accordingly, this study asks how invoices are currently processed and where the manual process fails, what requirements an automated invoice workflow should meet, what challenges are faced with implementing traditional ERP and accounting systems, and to what extent AI is suited for the use of financial processes of this kind.

RESEARCH DESIGN AND METHODOLOGY

Research method

Action Design Research (ADR) is a research design method in which prescriptive design knowledge is generated by building and evaluating IT artefacts in an organisational setting (Sein et al., 2011). It is further suggested that ADR addresses a problem encountered in a specific organisational setting through intervention and evaluation; secondly, it constructs and evaluates an IT artefact that addresses the class of issues symbolised by the encountered situation. This study aimed to understand a specific problem encountered in an organisation that could be resolved through the development of an IT artefact, which is the essence of the ADR methodology. ADR was therefore deemed the most appropriate research design method.

The foundation of the ADR methodology consists of four stages and seven principles (Sein et al., 2011). The stages are illustrated within the context of the study in the table below.

Table 1: ADR in the context of the study

Stage	Description	Principle	Function within the study
Stage 1: Problem formulation	Problem statement refinement - New desired outcome	Principle 1: Practice inspired Principle 2: Theory ingrained	The feedback from participants was summarised and considered together with the literature and the initial problem statement to develop a refined problem statement and a new desired outcome.

CC BY-NC 4.0

Stage 2: Building, intervention, and evaluation	Verification and validation statement, and artefact design	Principle 3: Reciprocal shaping Principle 4: Mutually influential roles	Requirements elicited from participants were used to formulate the verification and validation criteria and to specify the conceptual design of an automated workflow. The instantiation, intervention and evaluation of a working artefact are deferred to future work.
Stage 3: Reflection and learning	Verification and validation per industry participants	Principle 5: Authentic and concurrent evaluation Principle 6: Guided émergence	Reserved for future work.
Stage 4: Formalisation of learning	Final validated artefact	Principle 7: Generalised outcomes	Reserved for future work.

Source: Adapted from Sein et al. (2011)

This paper reports on Stage 1 and the conceptual-design portion of Stage 2 of the ADR process. The Building, Intervention and Evaluation (BIE) cycles within Stage 2, together with Stages 3 and 4, are reserved for future work, in which a prototype of the proposed workflow will be built, deployed in the organisational setting, and benchmarked against traditional ERP and EDI approaches on cost, accuracy, and skill requirements.

Stage 1 of the ADR process is about formulating a problem statement. This was done in the introduction, which presented the study's background, an overview of the problem, and the research objectives. To formulate the initial problem statement, the literature is used to support the researchers' perception of the existing problem. Furthermore, the problem statement was refined in response to participant feedback, which may validate or challenge the initial statement. Stage 1 further addresses the objectives of evaluating an existing manual invoice workflow as well as the limitations surrounding traditional systems.

Stage 2 focuses on formulating success criteria to validate and verify the proposed solution, which may address the problem statement. This information was also obtained from participant feedback, which identifies the criteria that must be met to address the current situation. Stage 2 also addresses the objectives of formulating an ideal automated invoicing workflow and evaluates the suitability of AI as a tool to automate similar finance processes.

Considering the participant feedback, an ideal automated invoicing process flow

was developed to address the limitations experienced as a result of the existing manual process and ERP systems that are in place. AI was further explored as an option to develop such an automated process and enhance existing ERP and accounting systems.

Population and sampling

The population within the context of research refers to the specific target group that the research aims to study (Majid, 2018). The population targeted in this research formed part of an international manufacturing company representing multiple acquired manufacturing businesses with unique operating models and customers. The group of companies have experienced rapid growth, with multiple acquisitions made in recent years, and more are planned for the near future. The group of companies' operating model is to own and acquire complete supply chains of existing organisations. The organisations then continue to own the brands, and the company becomes a dedicated manufacturer and distributor for the customer. This means that many of these facilities and business units are designed to cater to dedicated customers and suppliers with unique requirements, particularly in terms of invoice processing practices. The chosen organisation also represents multiple businesses that were acquired allowing for results to be applied to a broader range of operating models rather than just a single organisation. The group of companies operates with a central finance and IT team supporting business units worldwide to standardise practices as far as reasonably possible whilst maintaining the requirements of the individual businesses and their customers. These teams also use external consultants to assist in implementing traditional tools for automating processes. Therefore, this study's target population included external consultants and finance and IT personnel who represented multiple levels of seniority within the organisation. The participants further represented multiple previously acquired businesses that have unique customers and operating models, thus allowing for better general application of results from the study.

A sample is a representative group of the target population (Majid, 2018). Taherdoost (2016) describes a sampling framework as the actual cases within the population from which the sample will be selected. In general, sampling techniques are divided into two methods, namely probability sampling and non-probability sampling (Taherdoost, 2016). Probability sampling is a random method in which each unit has an equal chance of being selected and is mainly used when researchers want to represent a large population with some degree of generalisation (Sharma, 2017). In contrast, Majid (2018) states that non-probability sampling is often associated with qualitative methods or case studies where a real-life phenomenon is being studied, and samples are selected based on specific criteria. Participants in non-probability sampling do not have to be random, but a clear rationale needs to be stated as to why some participants are included and others are not (Majid, 2018). Since this study employs a qualitative research methodology aimed at addressing a specific problem, a non-probability sampling technique was used. Non-probability sampling has four subcategories, namely quota sampling, snowball sampling, convenience sampling, and judgement sampling (Taherdoost, 2016). Judgement sampling is a method in which the researchers select participants specifically based on their experience and characteristics, as they are deemed to have the appropriate knowledge and are a good representation of the population (Taherdoost, 2016).

This study utilised semi-structured interviews comprising finance and accounting personnel operating at various levels of seniority within the organisation, who also represented multiple previously

CC BY-NC 4.0

acquired businesses with unique operating models and customers. Additionally, external consultants supporting the business with its accounting and ERP needs have also been included as part of the sampling pool. These participants were deemed to have the required knowledge and expertise to represent a more general population and have input into addressing the specific research objectives. Although a wide range of participants have been selected that represent multiple companies under an umbrella company, there are still limitations arising. These limitations include limited ERP and accounting systems, an example of a manual invoice process, and representation only within the manufacturing sector.

Data collection and analysis

The participants were based in various locations, both locally and internationally, so these interviews were held on the online platform Microsoft Teams.

The interview questions aimed to explore participants' experiences with the current invoice processing workflow and identify areas for improvement using automation and AI. The questions focused on understanding the existing invoice workflow, perceived limitations, and challenges in the current process. Participants shared their views on how much automation could enhance efficiency, accuracy, and overall effectiveness. They also described the features they would expect from an automated invoice solution. Furthermore, the questions examined the role of current ERP and accounting systems, looking at their capabilities, limitations, and future potential. Participants discussed whether existing or planned systems could effectively automate invoice processing and assessed the value of AI as a supportive tool in finance. The interviews also investigated views on AI implementation. Overall, these questions aimed to provide insights into current operational challenges, user needs, and the practicality of implementing an AI-driven invoice automation solution.

Researchers often need to code their qualitative data to uncover meaning in the gathered information (Blair, 2015). Qualitative data coding entails labelling and sorting data to identify common themes and trends that can be analysed (Reyes et al., 2024). Microsoft Teams was used to conduct the interviews. Microsoft Teams has the functionality to record interviews and generate transcriptions. The transcribed text was used to identify common themes, words, and trends across participants' responses. The researchers manually reviewed the coded and summarised data and compared it to the notes taken during the interview, the overall transcribed data, and the summary provided by Microsoft Teams.

RESULTS AND DISCUSSION

This section summarises the findings against the four objectives of the study. The first aim of this paper was to evaluate an existing manual invoice process together with its perceived limitations. Secondly, the perceived benefits of an automated process and what such a workflow will look like. Thirdly, the limitations associated with traditional ERP and accounting systems. Lastly, the suitability of using AI as a tool within finance to automate processes was explored. The interview questions were structured to address the specific objectives outlined in this study and set up in such a way as to make themed coding easier. Based on the feedback obtained from the interviews, the researchers identified four main themes, as well as two sub-themes for each main theme. The roles and functions of the participants within the organisation are summarised in Table 2 below:

CC BY-NC 4.0

Table 2: Interviewed participants

Participant	Job Title	Qualification	Years of Service
P1	Accounting administrator	Diploma in logistics and supply chain management	2
P2	Finance Manager	CA (South Africa)	7
P3	External Compliance Accountant	CA (South Africa)	15
P4	Accounting Clerk	BCom Accounting	3
P5	Finance Executive	CA (India); MCom	4
P6	Chief Financial Officer	CA (India)	5
P7	Supply Chain and Systems Specialist	Multiple SAP, AI, and supply chain courses	22
P8	IT Manager	BTech information technology	4
P9	Chief Technology	BTech computer engineering; MBA	4
P10	IT Consultant	BSc computer science	25

The researchers summarised the four themes, each with two sub-themes, in Table 3. The four main themes were details related to a current invoice process, the ideal automated process, limitations associated with traditional ERP and accounting systems, and how AI is perceived as a finance tool. The sub-themes provided further details and insights into each of the main themes.

Table 3: Summary of themes and sub-themes

Main Theme	Sub-themes
1. The current invoice process	Operational steps of the existing process: Participants described the detailed sequence of manual steps followed during invoice receipt, verification, approval, and posting. Limitations and frustrations with the manual process: Recurring issues such as delays, data entry errors, repetitive tasks, and lack of real-time visibility emerged as key frustrations in the current system.
2. The ideal automated process	Desired steps and functional requirements: Participants envisioned an integrated, automated workflow with

CC BY-NC 4.0

Main Theme	Sub-themes
	capabilities such as digital invoice capture, validation, and seamless system integration. Perceived advantages of automation: Interviewees highlighted anticipated benefits such as improved efficiency, accuracy, reduced workload, and enhanced transparency across financial operations.
3. Limitations of traditional ERP and accounting systems	Restricted adaptability and high implementation costs: Participants emphasised that conventional ERP systems are rigid, costly to customise, and difficult to adapt to dynamic operational needs. High skill and maintenance requirements: The need for specialised technical skills and continuous system maintenance was viewed as a barrier to accessibility and usability.
4. Artificial intelligence (AI) as a tool in finance	Uncertainty and job-related concerns: Some participants expressed apprehension regarding AI's implications, including fears of job displacement and uncertainty about its ethical use in financial processes. Perceived advantages and opportunities of AI adoption: Others viewed AI as a valuable enabler that could enhance analytical capability, improve decision-making, and optimise financial efficiency.

Source: Researchers' own

Theme one: Understanding the current invoice process

Sub-theme one: Operational steps of the existing process

Participants P1 to P6 described the current invoice process, with P1, P2, P4, and P5 providing the most detailed steps, as it forms part of their day-to-day work. The invoice process was broken down into manual supplier invoice processing, manual sales invoice processing, and manual remittance processing. ("I would say we can summarise it as three main processes under the invoice umbrella. For me this will include the invoices that we receive from all our creditors and then the sales invoices that we need to generate and upload onto the portal. We also capture the payment advice that we receive so that we update the accounts receivable.")

For manual supplier invoicing, participants noted that invoices are received in various formats at a designated email address. P1 verifies these invoices, and if they are rejected, P1 will send a notification to the supplier. If the invoice is valid, the data will be captured in a sheet, which will be used to update the local and international ERP systems. This data is reviewed by P2 and shared with P3, P4, and P5, who are responsible for global accounts. The invoices are also filed during the process for safekeeping. For manual sales invoice processing, participants noted that purchase orders are received at a designated email address. P1 manually captures the data into a sheet and the local ERP system. P1 shares an email

with P3 containing the sheet and the PO to generate a sales invoice in a specific file format. P3 will return the sales invoice to P1 for confirmation of its accuracy before uploading it to the customer's online portal. ("Generating the sales invoices manually takes the longest time by far. The portals are so sensitive and reject the files. It probably takes up to 6 minutes if all goes well and it is uploaded the first time successfully. The other smaller tasks take like 30 seconds to a minute each, but the sales invoices are honestly a mission.")

P1 stated that remittance details are received at a designated email address in the form of a PDF statement. P1 files the documents, captures the data into a sheet and the local ERP system, and then shares the information with P3 and P4 to update the international ERP system. P5 noted significant duplication in this process, as the same remittance might be entered multiple times in error.

Considering all relevant participants' responses, the existing manual invoice process can be summarised into three activities, namely supplier invoice processing, sales invoice processing, and remittance processing. Although supplier invoices, customer purchase orders, and remittances are received automatically through email, more than 80% of the remaining tasks are manual. The consolidated manual invoice process flow is illustrated in Figure 2.

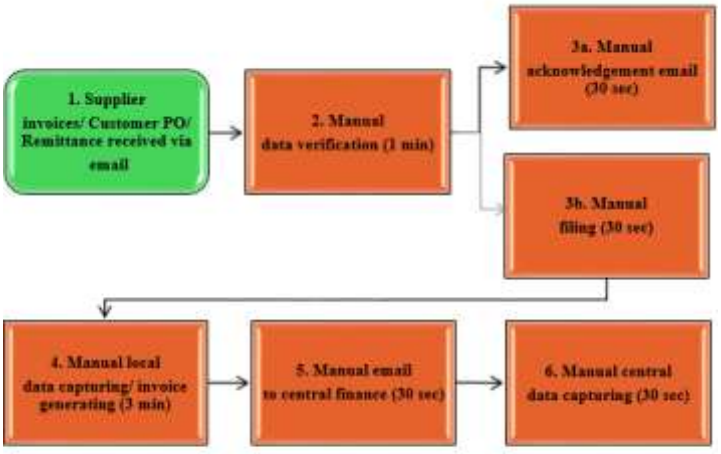


Figure 2: Manual supplier invoice processing flow

Source: Own

The approximate time for these manual transactions to be completed can take up to 6 minutes and is mostly driven by the verification time and manual sales invoice generation steps. The time allocated to each step was derived from participant feedback during the interviews.

Sub-theme two: Limitations and frustrations with the manual process

P3 and P6 were the most vocal about the limitations and challenges. This is understandable as P6 is a senior who receives all escalations related to manual errors, system misalignment, and excessive workload. P3 indicated that the process is tedious and risks missing statutory submission deadlines each month. P1 and P4 both indicated that the high volume of transactions and the high level of manual intervention make the process prone to delays and human errors, leading to friction among teams and missed deadlines. ("You know how we fight at month-end. It is so difficult to make sure we have everyone's systems to agree. We do make mistakes, but it is a lot

CC BY-NC 4.0

of work.") This is to be expected as P1 and P4 both receive and process the transactions first-hand. The process is considered time-consuming and has over 80% manual steps that need to be completed. ("The workload is too much with all the manual work we need to do. I feel like the system is working against me, and 80 to 90% of the work is done manually just to make sure the system is happy.")

Theme two: What an ideal automated process will look like

Sub-theme one: Desired steps and functional requirements

Since P1 and P4 are closest to the manual process, they provided the most feedback on what an automated process should look like. ("We need everything automated. The emails, filing, data capturing, and sales invoices, especially. Well, the emails are automated in a sense, but when there are issues with invoices, I would say we need an automated email to be sent to people. Maybe we can even have the emails sent to global also automated so that we don't miss it accidentally.") The key functionalities highlighted were:

- Automated email receiving,
- automated attachment filing,
- automated capturing of accounts payable,
- automated return emails to senders,
- automated generation of sales invoices,
- automated capturing of accounts receivable,
- and an automated daily email is sent to central accounts containing the latest information.

P1 and P4 mentioned that it is essential to cover all steps of the manual process, but they would prefer these steps to be fully automated to avoid the challenges discussed in section 3.1.2. P2 describes an ideal automation process as one that captures the end-to-end invoice process with limited manual intervention. P3, P5, and P6 said an automated process is ideal but should not result in additional manual tasks when implementing a new system. P5 also mentioned that duplications should be automatically avoided, specifically in the remittance process.

Considering all relevant participants' responses, an ideal automated workflow of the current invoicing system can be illustrated using Figure 3.

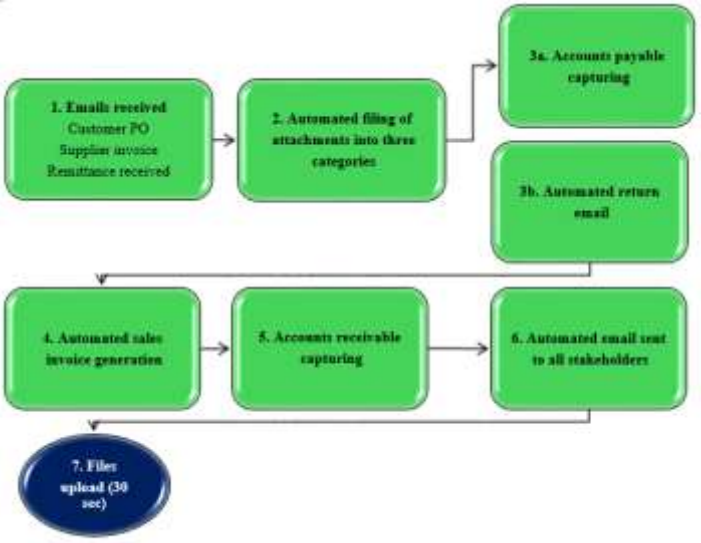


Figure 3: Automated invoice processing flow

Source: Own

CC BY-NC 4.0

The only step that remains semi-manual will be that of importing data into the global ERP system. The rest of the steps have the ability to be fully automated. Based on participants' expectations, the automated process flow is expected to reduce the time taken for manual tasks from 6 minutes to only 30 seconds. ("If we can reduce the time to like 30 seconds, that will be great. I mean, maybe global will still import the files, so there will be time spent, but if all the manual stuff can be automated, then we can save a lot of time.")

Sub-theme two: Perceived advantages of automation

P1 and P4 mentioned that an automated system will allow them to focus on other, more value-added tasks. ("I feel my time can be better spent if I don't have to do data capturing all the time.") P3 believes that an automated system will bring efficiency and productivity. It will further eliminate frictions and allow crucial deadlines to be met. P6 advocates an automated system because it is perceived to eliminate human error, thereby reducing misalignment between systems and accounts. Better alignment across systems enables more effortless month-end closing and less pressure to complete statutory submissions on time. P7 is a systems expert and has been implementing various automation projects. This participant believed that all manual tasks should be automated to a certain degree, as it would save the company money in the long run.

Theme three: Limitations of traditional ERP and accounting systems within the organisation

Sub-theme one: Restricted adaptability and high implementation cost

P8 and P10 are IT experts who have implemented and rolled out many traditional ERP and accounting systems. They believe there is a benefit in implementing ERP and accounting systems and encourage organisations to do so. That said, P8 stated that senior leadership needs to approve the scope at the outset and avoid unnecessary changes, as they are costly and challenging to implement. Project scoping can take as long as, or even longer than, implementing the available modular packages, since they need to be adapted to specific client needs. P7 has experience in implementing ERP systems, such as SAP. P7 mentioned that there were still technical issues more than five years after implementation. ("You know how I complain about SAP. It is more than five years now and they still can't get it right. The more I tell them our operations are different, the more they say this works for lots of other companies. I don't even want to know the bill we pay these consultants.") This has led to many tasks being done manually outside of the system. Further to this, fears related to prior projects have caused the scoping of new ERP systems at other business units to take longer than two years. P7 also mentioned that the work and cost required to correct a system after it is implemented felt like a new project, which ultimately led people to get used to working outside the system. P1 did not seem convinced that a new ERP system would be implemented soon due to ongoing scope changes, and P4 did not believe it would eliminate the manual tasks. P9 is part of the board of directors and mentioned that it makes sense to implement systems that improve efficiency and productivity, but emphasised that strategic alignment from all stakeholders is necessary to ensure that implementation and operational costs are recovered through efficiencies.

When asked about the technical capabilities of ERP and accounting systems, P4, P8, and P10 mentioned that systems such as SAP and Sage include OCR capabilities that can automate data capture. In their experience, however, the OCR systems are not accurate and lack machine learning capabilities to learn from their mistakes, preventing them from being corrected in the future. This means even this automated function will require manual review.

CC BY-NC 4.0

Sub-theme two: High skill and maintenance requirements

P4, P8, P9, and P10 are best qualified to provide input on skills and maintenance requirements, given their backgrounds. P4 mentioned that after five years of completing an SAP implementation project, consultants remained on standby to assist with workarounds when manual employee intervention couldn't resolve system errors. This ultimately leads to a significant ongoing maintenance cost. P8 and P9 believed that ERP systems' success depends on stakeholders' skill levels during the design, implementation, and live phases. ("We can't think that the system will work if we don't have the right people. Our people need to be trained or we need to have the right level of skill or these projects will always remain a problem.") Whilst the system is designed to simplify processes, in many cases it adds complexity that requires higher-skilled employees in the long run.

Theme four: AI as a tool in finance to automate existing organisational processes

3.4.1. Sub-theme one: Uncertainty and job-related concerns

The majority of the participants indicated that AI should form part of the workplace in the future. P2 showed signs of uncertainty and indicated that AI might take over employees' work in the future. ("What if I don't have a job because of this? I have seen reports where they say they have reduced jobs because AI can do it better.") P3 believed there are still some governance concerns regarding AI and wondered how these would be addressed. ("We need to make sure the access is limited, and we have a policy in place. I am worried that people will misuse AI.") It is worth noting that all participants had prior exposure and training in AI, except P2 and P3, which might explain the reason for their concerns.

3.4.2. Sub-theme two: Perceived advantages and opportunities of AI adoption

Even though P2 and P3 had some reservations, they believed that AI can be used to automate financial processes to their benefit. ("If it is done correctly, then we can perhaps make our jobs easier.") P1, having had training on AI, and who is also involved in most of the manual tasks mentioned, stated that AI can reduce her workload if it is implemented in a way that supports existing systems. ("Now that I think about it, we should get AI to generate the Excel sheets for us automatically and then we can use and upload those sheets into SAP.") P7 said that AI is easier to understand and deploy than traditional ERP systems, thereby reducing skill requirements and eliminating high implementation costs. P7 also stated that AI is easier to adapt to specific needs, can automate inevitable manual tasks, and can even perform work that employees are forced to do outside of the system. P8 and P9 believed AI is the future and will be incorporated into ERP and accounting systems. In general, participants seemed to agree that AI will be part of the future and that organisations can benefit from it.

Summary of results

Participants highlighted several challenges with the existing invoicing process. It is important to note that the organisation uses well-known ERP and accounting systems, yet participants still operate at a low level of automation and perform many manual tasks that are prone to human error. According to Myers et al. (2015), invoice processing is a common but often unique process that many organisations do manually, causing this process to be prone to data capturing inaccuracies and excessive manual steps. Many companies choose to automate this process, but a challenge arises as traditional digital systems rarely address all the specific requirements without incorporating some form of a custom solution (Arslan, 2022).

Participants mentioned that ERP and accounting systems are essential for

CC BY-NC 4.0

business success, but implementing them or adapting them to specific user needs comes at a high cost. A challenge arises when ERP and accounting systems are required, but result in additional manual, offline tasks. Working outside of the system creates further frustrations within the organisation and amongst team members. A study by Singh et al. (2023) found that many organisations implementing traditional digital applications, such as ERP systems, could not improve their performance as effectively as anticipated. The study reported that many of the organisations saw a decrease in their profits year after year, coming as a result of reduced agility due to system constraints, high capital investment, and ongoing operational costs associated with post-implementation issues that lasted on average for more than 36 months (Singh et al., 2023). On the other hand, a study showed that 70% of global participants and 81% of South African participants believe that operating profits will increase by at least 3% by 2030 as a result of using AI in operations (Burger, 2025).

The existing invoice process is deemed very manual, with many steps. Understanding the process and gaining insights into what an automated process should look like enabled the researchers to develop a process flow that reduces the number of steps through consolidation and increases automation. The overall impact is that 80% of the steps are manual in the existing process, and only one step is semi-manual in the proposed automated workflow. The proposed automated workflow will also reduce the time taken to perform manual steps from approximately 6 minutes to only 30 seconds.

Furthermore, the majority of participants also believed that AI could enable automated invoicing and enhance the functionality of existing ERP and accounting systems. Two participants showed hesitance, but it is likely due to their lack of exposure to AI. They have, however, indicated that if it is implemented in a transparent manner, it can ease their workload. This is not an uncommon theme as research has shown that employees might experience anxiety due to the misperception that AI is there to replace them; in many instances, solutions are developed to assist employees in being more efficient and focusing on value-adding tasks aligned with their level of expertise (Mirbabaie et al., 2021). Participants have indicated that AI can possibly be used to enhance existing processes and applications without spending significant time, cost, and resources. Liang and Wu (2022) found that the benefits of AI in accounting and finance lie in increased productivity, improved reliability of data, reduced fraud, and agility in adapting to new system requirements, which are similar to the advantages described by participants.

CONCLUSION

This study focused on a specific invoice process within a particular organisation. Qualitative interviews were conducted with selected participants based on their specific expertise with the current invoice process. The findings are consistent with the premise that a system delivers benefit only where it fits the task it supports. The feedback obtained revealed that the current process is heavily dependent on manual intervention, with approximately 80% of tasks performed manually. Participants expressed clear frustration with inefficiencies, duplication of effort, and the additional offline work required despite the presence of established ERP and accounting systems. The proposed automated process is projected to reduce the amount of manual tasks and time taken to perform these tasks. It further illustrates the potential efficiency gains that could be achieved through intelligent automation, as the level of accuracy is also expected to be higher due to the elimination of

CC BY-NC 4.0

possible human error. Participant feedback further emphasised that AI-supported applications are perceived to have strong potential to either complement or enhance existing systems more cost-effectively and adaptively than traditional customisation approaches, although this perception was not empirically tested in the present study.

This study contributes by addressing the automation of financial processes, such as invoice processing, as an integrated problem rather than separate elements. It documents a complete workflow in an organisational setting and establishes why approximately 80% of tasks remain manual even though established ERP and accounting systems are in use. It further evaluates AI as an alternative or complementary tool that could automate the manual tasks. In practice, organisations should assess their automation needs not only by considering the tasks the ERP and accounting systems aim to automate, but also the subsequent manual tasks that can be generated as a result of implementing such systems. There are several limitations that are worth acknowledging. Although participants represented multiple acquired businesses with different operating models and customers, the findings represent ERP and accounting systems, customer portals, and a single invoice process as perceived by ten participants who form part of the same group of companies. Generalisation to other industries can therefore not be assumed. The perceived time savings are derived from participant feedback as opposed to measured results from a built artefact. The improved automated workflow is therefore a representation of automation requirements as opposed to an actual tested model.

Within the scope of this study, the study concludes that AI-supported automation is a promising candidate technology worth prototyping and evaluating against traditional ERP customisation approaches. A stronger empirical claim about AI as a viable alternative would require building and measuring at least one component of the proposed workflow (for example, the information extraction step), benchmarking it against accuracy, cost, and skill requirements, and replicating the study in other organisational contexts.

REFERENCES

Agrawal, A., Gans, J. & Goldfarb, A. 2019. The economics of artificial intelligence: An agenda. University of Chicago Press.

Akrong, G.B., Shao, Y. & Owusu, E. 2022. Overcoming the challenges of enterprise resource planning (ERP): A systematic review approach. International Journal of Enterprise Information Systems (IJEIS), 18(1): 1-41.

Arslan, H. 2022. End to end invoice processing application based on key fields extraction. IEEE Access, 10: 78398-78413.

Baviskar, D., Ahirrao, S. & Kotecha, K. 2021. Multi-layout unstructured invoice documents dataset: A dataset for template-free invoice processing and its evaluation using AI approaches. IEEE Access, 9: 101494-101512.

Blair, E. 2015. A reflexive exploration of two qualitative data coding techniques. Journal of Methods and Measurement in the Social Sciences, 6(1): 14-29.

Burger, S. 2025. AI is helping to address some challenges in manufacturing operations. Engineering News. Available at: https://www.engineeringnews.co.za/article/ai-is-helping-to-address-some-challenges-in-manufacturing-operations-pwc-2025-07-16. [Access date: 12.01.2026].

Copeland, J. 2015. Artificial intelligence: A philosophical introduction. John Wiley & Sons.

Dragomirescu, O.A., Crăciun, P.C. & Bologa, A.R. 2025. Enhancing invoice processing automation through the integration of devops, methodologies and machine learning. Systems, 13(2): 87.

Eisfeldt, A.L. & Schubert, G. 2024. AI and finance. National Bureau of Economic Research Working Paper 33076.

Fraser, L. 2025. One skill that will guarantee you a job in South Africa. Pnet. Available at: https://businesstech.co.za/news/technology/820826/one-skill-that-will-guarantee-you-a-job-in-south-africa/. [Access date: 15.12.2025].

CC BY-NC 4.0

Goodhue, D.L. and Thompson, R.L., 1995. Task-technology fit and individual performance. MIS quarterly, 19(2), pp.213-236.

Govender, D., Nel, C. & Wessels, B. 2025. Navigating the future; AI-driven job market insights for South Africa. Deloitte South Africa. Available at: https://www.deloitte.com/global/en/issues/work/genz-millennial-survey.html. [Access date: 12.01.2026].

Hameed, H.A. 2020. Artificial intelligence: What it was, and what it should be. International Journal of Advanced Computer Science and Applications, 11(6): 70-75.

Kielanowicz, Ż. & Wnuk-Pel, T. 2023. Financial processes automations' impact on the work of management accountants. European Research Studies Journal, 26(3): 66-77.

Krieger, F., Drews, P. & Funk, B. 2023. Automated invoice processing: Machine learning-based information extraction for long tail suppliers. Intelligent Systems with Applications, 20: 200285.

Liang, P. & Wu, L. 2022. The application of artificial intelligence in accounting. International Conference on Computer Network, Electronic and Automation (ICCNEA): 55-59.

Majid, U. 2018. Research fundamentals: Study design, population, and sample size. Undergraduate research in natural and clinical science and technology journal, 2(1): 1-7.

Martinek-Jaguszewska, K. 2018. Znaczenie i rola automatyzacji procesów biznesowych-wyniki badań pilotażowych. Organizacja i Kierowanie, 183(4): 229-247.

Mirbabaie, M., Brünker, F., Möllmann, N.R. & Stieglitz, S. 2021. The rise of artificial intelligence–understanding the AI identity threat at the workplace. Electronic Markets: 1-27.

Myers, P., Kavas, I., Muller, M. & Solove, J. 2015. Intelligent Document Capture with Ephesoft. Packt Publishing Ltd.

Rapanyane, M.B. & Sethole, F.R. 2020. The rise of artificial intelligence and robots in the 4th Industrial Revolution: implications for future South African job creation. Contemporary Social Science, 15(4): 489-501.

Reyes, V., Bogumil, E. & Welch, L.E. 2024. The living codebook: Documenting the process of qualitative data analysis. Sociological Methods & Research, 53(1): 89-120.

Sein, M.K., Henfridsson, O., Purao, S., Rossi, M. & Lindgren, R. 2011. Action design research. MIS Quarterly, 35(1):37-56.

Sharma, G. 2017. Pros and cons of different sampling techniques. International Journal of Applied Sciences, 3(7): 749-752.

Singh, N.P. 2006. Tiers of enterprise resource planning softwares. Asia-Pacific Journal of Management Research and Innovation, 2(2): 68-80.

Singh, S., Singh, S. & Misra, S.C. 2023. Post-implementation challenges of ERP system in pharmaceutical companies. International Journal of Quality & Reliability Management, 40(4): 889-921.

Song, Y., Zhang, Y., Zhang, Z. & Sahut, J.M. 2025. Artificial intelligence, digital finance, and green innovation. Global Finance Journal, 64: 101072.

Taherdoost, H. 2016. Sampling methods in research methodology; how to choose a sampling technique for research. International Journal of Academic Research in Management (IJARM), 5(4): 18-27.

Appendix A:

Interview questions and protocol

The following topics and questions was asked during Teams interviews. The questions are specifically structured to address the objectives and answer the research questions. Thematic coding was made easy with this approach as the questions were set up to address specific objectives. The researcher will identify any outliers in answers that could possibly lead to themes and topics outside of the objectives that might still be deemed as appropriate to the study.

Questions/Discussion Topics	Reason for Question/Discussion Topic
Please describe the current invoice process.	It is important to understand the workflow of a manual process especially in the presence of existing ERP and accounting systems.
Could you please elaborate on the limitations of the current invoice process?	Understanding the limitations will help refine the problem statement.
Would you prefer the current invoice system to be automated, and why?	This question helps to further elaborate on the perceived benefits of an automated workflow.
What ERP and accounting systems are currently in place?	It is helpful to understand the current tools available, as well as the possible reasons why they are not used to automate the system. This also helps refine the problem statement while also enhancing the literature review.
Which ERP and accounting system might be implemented in the future?	It is essential to consider future systems that may be implemented, as they could potentially address the same problem. These systems should at least be considered when evaluating the suitability of AI.
Do you think current or future ERP and accounting systems could automate the current invoice processing system?	Depending on the answers to this question, the results might point to ERP and accounting systems being replaced or enhanced by AI.
Which functions would you like an automated invoice process to have?	The input from participants is essential, as the model aims to add value to their daily operations. The specific required functions and any existing issues will be taken into consideration when describing an ideal automated workflow.
Do you believe AI should be incorporated into the organisation?	This question aims to understand the participants' views on the use of AI and, at the same time, address any anxiety and misperceptions caused by the introduction of AI into the organisation.
Would an AI tool that automates the current invoicing system add value?	After addressing any concerns highlighted in the previous question, this question is used as validation to confirm that the tool will add value to the organisation and its participants.