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Enterprise resource planning (ERP) system implementation in a manufacturing firm: Rationales, benefits, challenges and management accounting ramifications

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Abstract

Research Question*:* What are the motives for adopting ERP in the case study firm, and its benefits and challenges? How has ERP got implicated in management accounting?

Motivation*:* Organisations implement ERP systems expecting various benefits. Rather than being a mere technological exercise, such an implementation has implications for organisational structure, decision-making process, and communications systems; hence the success will depend on many considerations. Despite the availability of survey studies, there is limited research on how ERP systems unfold in specific organisations amid varied contextual influences, unique benefits, challenges and management accounting ramifications.

Idea: Drawing case study evidence from a manufacturing firm in Sri Lanka, Sugar & Salt, this paper delves into the motives for the ERP system implementation, its benefits and challenges, as well as how the ERP system had got entangled in the management accounting practices of the firm.

Data: The data was collected through in-depth interviews with participants involved with the ERP system and management accounting work, informal conversations and documents review. Data have been analysed based on thematic analysis.

Tools: This study deploys the qualitative research methodology and case study strategy. It draws theoretical inspiration from institutional theory and brings together new institutional sociology (NIS) and old institutional economics (OIE).

Findings: Our findings suggest that while the implementation of the ERP system was driven by the pressure from the regional (South Asian) headquarters, it enabled streamlining of the

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management accounting function and facilitated the costing, budgeting as well as the internal reporting system. The ERP system has also allowed management accountants to move towards analytical work.

Contribution: The paper contributes to the literature on ERP and management accounting interface, extends the use of institutional theory in management accounting research, and provides insights to practitioners.

Keywords: Management accounting, management accountant, enterprise resource planning system, case study, qualitative methodology

JEL codes: M410

1. Introduction

Faced with globalisation pressures, business organisations have become more dynamic, complex, competitive, and interconnected by adopting various advanced technologies (Dahal, 2019). Information technology (IT) thus plays a pivotal role in modern organisations, not only as a support mechanism for the automation of organisational processes but also as a means of fundamentally changing how an organisation operates (Sangster *et al.,* 2009). The field of management accounting has been no exception to getting caught up in the wave of technology. Advancements in IT facilitate planning, decision-making, and problem-solving and enhance performance by adopting various IT-enabled systems and practices, such as enterprise resource planning (ERP) systems, the internet of things (IoT), big data, and data warehousing.

Amidst the array of new technologies, ERP as an integrated information system brings together different departments and functions into a single platform, enabling a centralised information flow. ERP could essentially be viewed as a cross-functional enterprise system that supports diverse functional areas, such as product planning, manufacturing, sales and distribution, marketing, material management, and accounting (Hooper, 2003). What inspires an organisation to adopt an ERP system would differ from entity to entity. Multinational corporations (MNCs) may implement ERP systems to obtain accurate financial and managerial reports, improve decision-making, eliminate non-value-adding activities, and maintain an integrated database (Scapens & Jazayeri, 2003; Wickramasinghe & Karunasekara, 2012; Hassan & Mouakket, 2016). In comparison, small and medium scaled enterprises (SME) may strive for improved organisational performance (Aremu *et al.,* 2020) and competitiveness (Sangster *et al.,* 2009) with the aid of ERP systems. Amid such motives and espoused technical merits, the success of an ERP system implementation will depend on a multitude of considerations, such as vision, top management contribution, quality of the business process re-engineering system, nature of communication channels, capabilities of the project manager, and the composition of the project team (Garg & Agarwal, 2014; Bravi *et al.,* 2021). Seeing in this light, implementing an ERP system is not a mere technological exercise but a complicated endeavour with wide-ranging implications on organisational structure, decision-making process, and communications systems (Hassan & Mouakket, 2016).

As a carrier of information, introducing an ERP system would provide better information for decision making, permit wider access, and increase data accuracy and relevance (Uçaktürk & Villard, 2013). It would also bring about far-reaching implications to the management accounting arena, such as to management accountants' roles (Sánchez-Rodríguez & Spraakman, 2012), profession (Heinzelmann, 2018), and practices (Scapens & Jazayeri, 2003). Notwithstanding these seemingly positive insinuations and the availability of several survey studies (see Garg & Agarwal, 2014; Wickramasinghe & Gunawardena, 2010), there is limited scholarly inquiry in prior literature on how ERP systems get unfolded in specific organisations amid varied contextual influences, as well as sustained benefits and challenges of such systems and management accounting ramifications. This paper addresses this apparent gap in the literature by illuminating a story of an ERP system implementation and how it has been intertwined with management accounting practices cascaded down to a multinational manufacturing company in Sri Lanka (identified as "Sugar & Salt" to maintain anonymity). It explores the following research questions.

1. What are the motives underlying the adoption of the ERP system in the case study firm?
2. What are the benefits and challenges of the ERP system?
3. How has the ERP system got implicated with management accounting?

Given the idiosyncrasies inherited in different organisational settings, our in-depth ERP case study is a noteworthy addition to the literature. Besides, it provides learning points for practitioners by explicating how ERP systems get enmeshed with management accounting and outlining the ensuing management accounting ramifications. Leaning on the theoretical conceptions of old institutional economics (OIE) and new institutional sociology (NIS), this paper also extends the use of the institutional theory perspective in management accounting research.

The remainder of this paper adopts the following broad structure. Section two offers a glimpse of past literature, followed by a depiction of the empirical setting, research methodology, and theoretical lens in section three. Section four presents field data from our case study firm, Sugar & Salt. Culminating the above, a discussion of findings as well as conclusions, contributions, and directions for future research are offered in sections five and six, respectively.

2. A Glimpse of prior literature

Drawing on prior literature, in what follows, we present an overview of ERP systems, implementation success, and challenges, as well as how ERP systems get intertwined with management accounting.

2.1 ERP systems, implementation success, and challenges

An ERP system integrates information and information-based processes within and across an organisation (Hooper, 2003) into a single system that can be used throughout an entity (Martins & Santos, 2021). It carries the benefit of being a unified, automated system that brings together multiple business functions, such as product lifecycle management, supply chain, sales, distribution, accounting, and finance, while enabling up-to-date information flow for internal reporting and decision-making (Mahmood *et al.,* 2019; Youssef & Mahama, 2021). Such a system increases the operational efficiency and performance effectiveness of management functions by providing real-time information for planning and monitoring (Uçaktürk & Villard, 2013), through easy access to stored data, less time needed for financial reporting, flexibility in creating reports (Hooper, 2003), and rapid responses to market changes (Youssef & Mahama, 2021).

Hunton *et al.* (2003) examined the longitudinal impact of ERP adoption on firm performance across firms which have adopted and not adopted ERP systems. Their findings indicate that the performance was significantly better over a 3-year period for adopters, as compared to nonadopters. It was also revealed that the financial performance of nonadopters decreased over time while it held steady for adopters, and that ERP adoption helps firms gain a competitive advantage over nonadopters. Despite such merits, ERP failure rates appear to be at a significantly high level (Mahmood *et al.,* 2019). Considering the benefits and risks, organisations must acquire a holistic understanding of what drives ERP success (Wickramasinghe & Gunawardena, 2010). Past research suggests that the success of an ERP system depends on an array of considerations, such as employees' attitudes toward change, capabilities of the top management, cross-functional coordination, business process re-engineering, software configuration, system development, project management, as well as consultant's capabilities (Grabski *et al.,* 2009; Garg & Agarwal, 2014). ERP success is also linked to strategic alignment. Velcu-Laitinen (2010) note that each stage of ERP implementation has its inherent intricacies, and there is substantial interdependency between the stages of ERP implementation and the success factors in one stage influencing the success of another.

The success of ERP systems particularly requires top-level managers to create a clear vision of how the system should operate to satisfy stakeholders (Wickramasinghe & Gunawardena, 2010). Grabski *et al.* (2009) pinpoint that process, expectations, interconnections, and correspondence as four types of system failure. It is further revealed that organisational culture/language, employee skill development and empowerment, top management commitment, regulatory and legal requirements, data security risk, customisation and change management tactics need close attention to ensure ERP success (Mahmood *et al.,* 2019). A longitudinal case study by Albu *et al.* (2015) which investigated how ERP systems are implemented and employed in a transition economy, showed how the ERP system substitutes management techniques, facilitates strategy formulation, and implementation, hence significantly improving organizational performance. Besides a multiple case study research based in Canada by Sánchez-Rodríguez and Spraakman (2012) revealed that although ERP systems carry advantages, such as improved flow and faster and easier access to information, an integrated database is complex and time-consuming to implement.

ERP implementations have been challenging, for the software is expensive and requires intensive personal training, while centralised data sources could pose potential security risks (Mahmood, 2019). Furthermore, common standard ERP systems may not be appropriate to different businesses and sectors; therefore, customising a system to suit a particular organisation's needs is a significant task (Hooper, 2003).

Amid these inherent advantages and disadvantages, ERP systems carry significant management accounting ramifications. This is turned to next.

2.2 ERP and management accounting change

Literature suggests that management accounting change could occur for multiple reasons, such as advanced technologies, market competitiveness, and new management practices (Granlund & Malmi, 2002). Notwithstanding claims that management accounting change is linked to the introduction of advanced information technologies (Rom & Rohde, 2006), an ERP system does not entirely change management accounting practices (Scapens & Jazayeri, 2003; Sánchez-Rodríguez & Spraakman, 2012; Malinić & Todorović, 2012). Instead, facilitate practices to become more streamlined and efficient (Heinzelmann, 2018). Sánchez-Rodríguez and Spraakman (2012) note that practices such as target costing and variance analysis remain constant with ERP implementations while configuring tools like activity-based costing (ABC) and balanced scorecard (BSC) into an ERP system poses difficulties due to the complexities involved.

On a similar tone, Scapens and Jazayeri (2003), based on a longitudinal case study on a US-based multinational corporation, espoused that the ERP implementation did not lead to introducing new management accounting techniques. Instead, it facilitated changes which were already taking place in the firm. Scapens and Jazayeri further identified standardisation, routinisation, integration, and centralisation as the main features of SAP. Such elements of SAP reinforced and facilitated management accounting change in terms of eliminating routine jobs, line managers acquiring accounting knowledge, providing more forward-looking information, and a broader role for the management accountant. Based on ten organisations in Finland which have implemented integrated information systems, Granlund and Malmi (2002) illuminated that despite no visible changes in the content of the information flow, the ERP system offered easier access to information and improved management accounting reports through standardised management accounting tools and improved transaction processing systems. Such systems also enable flexible and forward-looking information (Hassan & Mouakket, 2016; Wagner *et al.,* 2011), increase reliability and validity (Heinzelmann, 2018) as well as quality and accessibility of information (Jabłoński *et al.,* 2018). These features aid in tracking down transactions and improves the auditing function and internal controls (Chen *et al.,* 2012). The enlarged scope of capturing financial and non-financial information facilitated through an integrated information system (such as ERP) enhances the quality and timeliness of internal reporting and facilitates better decision-making (Granlund & Malmi, 2002; Sánchez-Rodríguez & Spraakman, 2012; Pervan & Dropulić, 2019). In this manner, ERP systems enable management accounting change in organisations.

2.3 ERP and the role of management accountants

ERP systems have profoundly impacted the role of management accountants (Sánchez-Rodríguez & Spraakman, 2012; Scapens & Jazayeri, 2003; Granlund & Malmi, 2002) and essentially changed the way they performed their tasks (Wickramasinghe & Karunasekara, 2012). Such a system enables a management accountant to shift towards creative and analytical roles from mundane data entry work (Scapens & Jazayeri, 2003; Chen *et al.,* 2012). The nature of work performed by management accountants has also changed due to facilitative features of ERP systems (Chen *et al.,* 2012), such as the automatic report generation, which has enabled management accountants to spend more time on an in-depth analysis (Jabłoński *et al.,* 2018), and interpretation of performance indicators (Scapens & Jazayeri, 2003). Such a shift also requires management accountants to expand their skill set, encompassing skills in IT, presentations, interpersonal and communication (Chen *et al.,* 2012; Pervan & Dropulić, 2019). These skills are in the province of contemporary management accountants, in addition to traditional professional accounting skills. Powered by ERP systems, management accounting work gets scattered across various functions. Non-finance managers thus become partially responsible for management accounting tasks and need to acquire basic accounting and finance knowledge (Scapens & Jazayeri, 2003).

Seen in this manner, while an ERP system could bring numerous benefits to an organisation, the implementation could be challenging, with significant implications on management accounting change and the role of the management accountant.

3. Empirical setting, research methodology, and theoretical lense

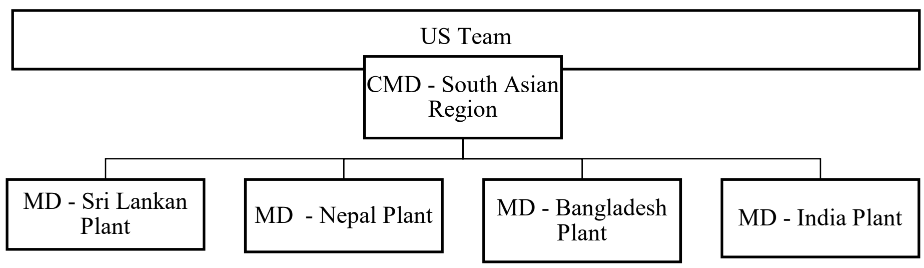
Empirical Setting: Sugar & Salt

This research focuses on ERP implementation, benefits, challenges and management accounting ramifications. Thus, selecting an organisation that had implemented an ERP system was necessary. In the quest for identifying a suitable entity for inquiry, through a casual conversation with a key official of Sugar & Salt, it was evident that the firm implemented an ERP system over a decade ago and continues it to date. It thus appeared to be an appropriate setting for the research. Capitalising on this personal contact, the approval for data collection was obtained from the senior management.

Sugar & Salt is a multinational corporation engaged in manufacturing, retailing, and advertising with a global presence in around 200 countries. It has a broad portfolio of products ranging from carbonated soft drinks and fruit juice to tea, coffee, energy drinks, and water. Its local organisational structure comprises a manufacturing plant and a distribution centre that imports the main ingredients and manufactures and distributes products. The firm possesses a countrywide distribution network and contributes to employment generation by offering over 2000 jobs directly and indirectly across manufacturing, transport, and retail businesses. As revealed through the company website, sustainability is at the core of its business operations. It has taken various measures towards innovation, saving the planet, community development, women empowerment, and value creation.

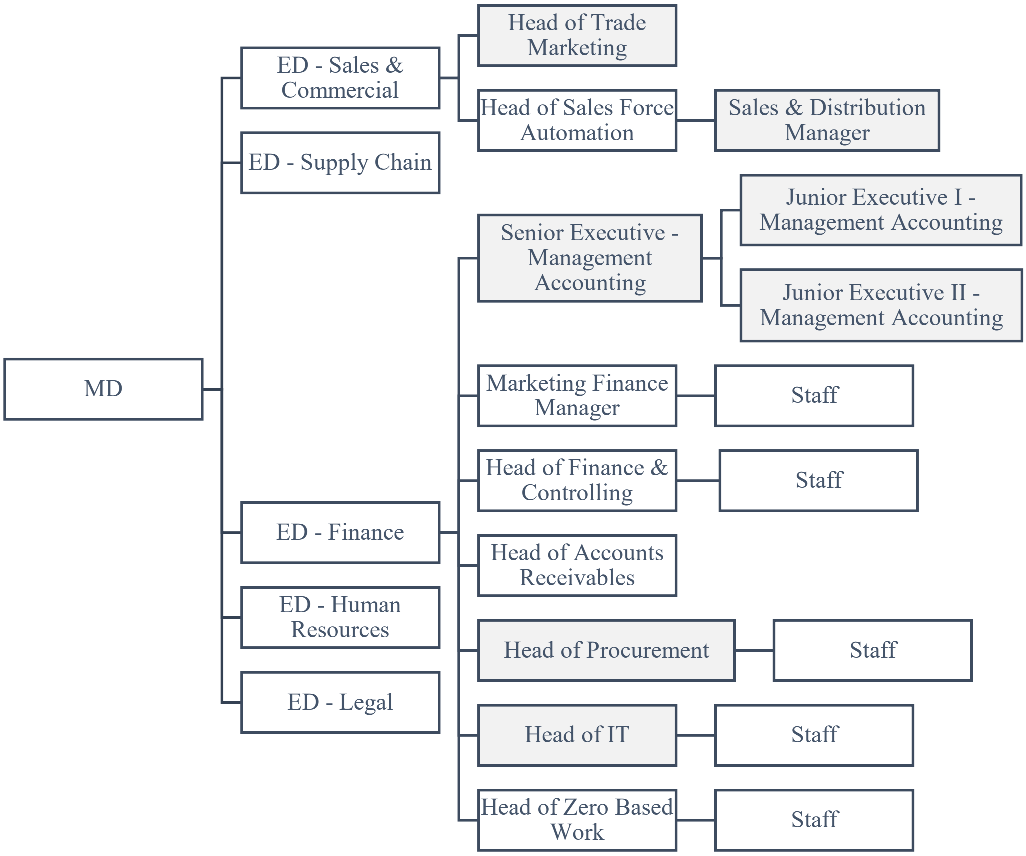
The global headquarters manage the firm's operations in various countries through regional offices, which provide directions and guidelines on preparing financial reports, administer periodic reports and coordinate operations between the global headquarters and local plants. The financial statements of Sugar & Salt and those of other South Asian countries such as Nepal, Bangladesh, and India are consolidated as South Asian region and reported to the Chief Managing Director (CMD) of the South Asian region, who in turn reports to the US team. See Figure 1.

Figure 1. Global structure



In terms of the Sri Lankan operations, while the Managing Director (MD) is at the helm, the Executive Directors (ED) of each department report to the MD. Reporting to ED are divisional heads, managers, executives and other staff members.

Figure 2. Partial organisational structure



The finance department is headed by ED – Finance. It comprises six subunits: management accounting, finance and controlling, accounts receivable, procurement, information technology, and zero-based work [1], which are led by department heads, managers and senior executives. See Figure 2.

3.2 Research methods and data

This paper adopts the qualitative methodology and case study strategy as the principle style of investigation (Denzin & Lincoln, 2011; Mason, 2002; Miles & Huberman, 1994; Silverman, 2000). It was deemed to be the most suitable option based on the nature of the research questions raised in this study. Keeping with this methodological orientation, our primary mode of data collection was in-depth interviews with participants directly involved with the ERP system and management accounting work. Since the data collection was carried out during the covid – 19 pandemic period, interviews were conducted online via platforms such as Zoom and Microsoft teams. During these online interviews, audio and video modes were 'switched on' while interviewees shared their screens to present documents and to clarify points. Informal conversations, telephone interviews, and the analysis of documents complemented the online interviews. Documents analysed include company annual reports, web pages, press releases, and various internal documents. Such documents include knowledge transfer reports (to convey knowledge and experience to new employees), status reports (to track the ERP implementation progress), and articles on the global newswire and internal newsletters. Triangulation of data obtained through these multiple sources increased our findings' credibility.

The data collection of this research spanned three phases. In the first phase, from October to November 2020, a pilot study was carried out to gain a basic understanding of company operations, organisational structure, accounting process, SAP modules in use, and other third-party IT solutions. During the second phase, from January to June 2021, interviews were extended to other functions for a more detailed exploration of the management accounting practices and the ensuing ERP implications by capturing emerging issues at the site. In the third phase, from September to October 2021, follow-up interviews were done to clarify any doubts. Accordingly, this study's data collection commenced with key management accounting department members. This included the Senior Executive - Management Accounting and two Junior Executives engaged in management accounting, as well as the Head - Procurement, who formerly served as a Management Accounting Executive and was involved in the SAP implementation in the initial years. Later, interviews were extended to marketing, IT, and sales areas as the initial interviews revealed that the marketing and sales departments were integrated with management accounting functions and the ERP system. Thus Head - Trade Marketing and Sales & Distribution Manager were interviewed to gain an overview of the inter-relationship between these departments and the connection with the ERP system. Further, both the Former Management Accountant, who was actively involved in implementing and executing the ERP system and the IT manager, who actively maintained the ERP system, were interviewed to gather information about ERP implementation and maintenance.

Accordingly, seven in-depth interviews spanning 35 – 75 minutes were carried out; four interviews were conducted with key members of the management accounting department, three interviewees were with members representing IT, Sales, and Marketing. The interviewees of the study (shown through shaded boxes in Figure 2) were selected based on their link to management accounting work and their involvement with the ERP system. See Table 1. While senior executive members attached to the finance function are involved in presenting financial statements and supporting top management decision-making, junior executives analyse data and generate reports. Insights afforded by members from IT and sales became invaluable in understanding the basic features of the firm's ERP system and how it facilitated the sales function through management accounting inputs.

Out of the seven interviewees, while two interviewees had joined the firm before the ERP implementation, one member was involved in the ERP system from its very early stages. Other four interviewees had joined the firm when the ERP system was mid-way. Therefore, these different interviewees shed important insights on the motives for adopting ERP in the case study firm, its benefits and challenges, and how ERP got implicated with management accounting, as focused on in this study. Supplementary to these formal interviews, the first-named author was involved in informal conversations with several firm members, and the thoughts expressed during these discussions were invaluable.

Table 1. Interviewee details

No.	Designation of interviewees	Work responsibilities	Experience	Interview duration (minutes)
1	Senior Executive - Management Accounting	Preparing and presenting financial reports to the South-Asian region and providing information for decision-making to the top management	5 years	75
2	Former Management Accounting Executive	Preparing and presenting financial reports to the South-Asian region and providing information for decision-making to the top management	12 years	50
3	Junior Executive I - Management Accounting	Preparing and distributing department budgets and fulfilling other internal reporting requirements	4-5 years	70
4	Junior Executive II – Management Accounting	Preparing and distributing department budgets and fulfilling other internal reporting requirements	4-5 years	35
5	Head - IT	Implementing new third-party solutions, updating and maintaining existing technological solutions	9 years	40
6	Head - Trade Marketing	Connecting with retailers and wholesalers, preparing and presenting sales-related documents to the top management and the South Asian region	13 years	47
7	Sales & Distribution Manager	Monitoring sales-related activities, preparing sales reports, and handling system issue	6-7 years	45

Interviews were digitally recorded and transcribed word-to-word and were examined for subsequent analysis. We then reinvented the ERP story in Sugar & Salt, drawing on the interpretations of various interviewees and perusal of different internal and published documents by identifying and reviewing the key themes and sub-themes which emerged from the data. Doing so triggered the idea that leaning on the theoretical underpinnings of OIE and NIS would be appropriate in making sense of data.

3.3 Theoretical lenses

This paper draws theoretical inspiration from institutional theory. It brings together the two strands, NIS and OIE, in illustrating how external pressures and the actions of internal management led to the ERP implementations and the resulting management accounting implications within the context of Sugar & Salt. Both NIS and OIE share similar conceptual grounds, espousing that institutions matter. Nevertheless, while the focus of NIS lies beyond organisational boundaries (DiMaggio & Powell, 1983; Kholeif *et al.,* 2007), OIE explores internal dynamics at the organisational level (Burns & Scapens, 2000; Ribeiro & Scapens, 2006; Ter Bogt & Scapens, 2019). More importantly, according to Moll *et al.* (2006), there is a potential for further development of institutional theory by bridging the gap between OIE and NIS and advancing understanding of the interaction between broader, social, and environmental pressures for change, external and organisational behaviours, choices, and responses internally. This paper serves as a response to the call for such convergence.

On the one hand, NIS explores how coercive, mimic, and normative influences arising through external macro institutional environmental forces such as broader political, social, and cultural norms bring in implications by way of international and regional pressures as well as market and competitor pressures, in shaping organisational structures, policies, and procedures (DiMaggio & Powell, 1983; Kholeif *et al.,* 2007; Meyer & Rowan, 1977; Meyer & Scott, 1983). NIS researchers thus argue that intra-organizational structures and procedures, including the choices and design of management practices and accounting tasks, are shaped by external pressures (Meyer & Scott, 1983). On the other hand, OIE posits that such choices and decisions are also influenced by internal considerations linked to habits, routines, as well as power and politics within organisations, which in turn lead to certain practices getting embedded as taken-for-granted practices within an organisation (Burns & Scapens, 2000; Molls *et al.,* 2006). In this manner, OIE offers a valuable impetus in explaining institutionalisation (Burns & Scapens, 2000), as well as institutional change and resistance (Ribeiro & Scapens, 2006) in the area of management accounting.

In making sense of complex organizational reality, such as motives for adoption, benefits, challenges and management accounting implications of ERP systems within a particular context as done in this research requires gaining a holistic understanding. While a single theory would only provide a partial explanation, deploying multiple theories has the potential to provide such a rich portrayal. Therefore, capitalising on the theoretical underpinnings of NIS and OIE we illuminate how an ERP system was implemented and enmeshed with management accounting change.

4. Empirical evidence

Capitalising on empirical evidence garnered from Sugar & Salt, in this section, we trace the motives underlying the adoption of an ERP system, accompanying benefits and challenges, and the interplay between the ERP system and management accounting.

4.1 Motives underlying the adoption of the ERP System

Sugar & Salt embarked on the ERP journey over a decade ago, following a direction from the regional (South Asian) office alongside the strong support from the firm's local management. Since then, the company has been successfully continuing with it for over a decade.

SAP ERP is recognised as the world's most powerful ERP application. It is well-known for its advanced features and is an expensive enterprise solution, which has also been implemented by multinational corporations worldwide, including fortune 500 companies. SAP application architecture enables the provision of comprehensive information via a modularised approach. The high level of integration across modules and their transparency have been salient features of the system. An SAP system was considered the most appropriate ERP solution for a complex organisation such as Sugar & Salt. A similar SAP template was implemented in other companies within the same region operating across different countries, prompting Sugary & Salt to follow suit. Following the implementation, progressive improvements were instigated to the SAP template.

The Head - Trade Marketing commented on the motives for the ERP implementation, stating, *"Our company is managed by a leading global company, which has several companies under it. It wanted to implement a common system for reporting and consolidation purposes."* In this manner, while the initial impetus for the SAP implementation project was cascaded down from the regional level management, the legacy system [2] upgrade requirements impelled the local management to embrace it. Besides, several external and environmental reasons were noteworthy. According to the IT manager, three reasons triggered the implementation. As he said:

> *"The first reason is that all the plants in our region use the SAP system. So, we had pressure from the regional level. Second, as there was volume growth in the market, and our management concluded that we needed to move to a more systematic database. Third, we needed to integrate all the departments to improve efficiency."*

Being a key personnel involved in the ERP implementation and maintenance, the Head - IT at the manufacturing plant elaborated that the regional office influenced and controlled the implementation. He further noted that due to increased competition and business growth, from an internal perspective, local office top management also felt a strong need for an integrated system that could provide accurate real-time data for business decisions. Shedding further light, Senior Executive - Management Accounting stated that being a multinational corporation, Sugar & Salt needed to move to a common platform pioneered by the head office to compare performance across entities worldwide.

As documentary evidence revealed, the SAP ERP system has an in-built functionality covering many modules to ensure a sustainable and long-term solution compared to other ERP solutions. Accordingly, Sugar & Salt adopted ten modules: Human Resources (HR), Pay Roll, Sales and Distribution, Warehouse Management, Production Planning, Procure to Pay, Controlling, Material Data Master, Finance and Fixed Assets.

4.2 ERP implementation: Benefits and challenges

An ERP system integrates information within and across an organisation into a single system (Hooper, 2003). Implementing an ERP system is a significant investment that could be justified by the long-term benefits an entity could derive from it. Such a system brings in significant benefits to an organisation (Hooper, 2003; Uçaktürk & Villard, 2013; Youssef & Mahama, 2021). Similarly, ERP has helped the case study firm improve key business activities and processes, as the Senior Executive of Management Accounting expressed, *"With an ERP system, everything is recorded automatically. The main benefit we got from it is fewer errors relating to accounting. Being a manufacturing firm, inventory is a major area that we earlier had error and frauds."* Another interviewee from the same department contributed to this point, stating, *"If we were to keep records manually for material consumptions and inventory-related data, it will take a lot of time and result in many errors".* With the SAP system, when the individual departments update their records, the entire system gets updated, and this has brought in greater accuracy and timeliness of management accounting reports.

On a further positive note, the Former Management Accounting Executive and a Sales & Distribution Manager highlighted greater visibility as a critical advantage of the ERP system. As these interviewees illuminated, the ERP system has enabled Sugar & Salt to obtain 360-degree visibility into the organisation's supply chain operations while permitting informed decisions. According to another interviewee from the Management Accounting area, the SAP system has allowed for capturing more data compared to the legacy system and enabled in-depth analysis via the drill-down facility. As she explained:

> *"When employees were manually recording daily sales, they might only be able to record information like reference number and sales amount. But the SAP system can be used to record more details, such as customers' reference number, name, amount purchased and the revenue of each sale separately."*

She continued, *"With SAP, we can keep detailed records on each sale, which helps us carry out an in-depth analysis.*"

As the Head - Trade Marketing pointed out, a salient feature of an ERP system is data integration, through recording and storing all data in a single mass database on a real-time basis. Another interviewee reinforced the same idea stating, *"Compared to the legacy system, SAP has given us easy access to data by integrating all the departments and allowing decision-makers to gain a more holistic view."* As revealed through the words of various interviewees, the ERP system has benefited finance and non-finance managers in numerous ways. When data is consistently stored in a single integrated database, retrieval of such data for financial reporting, operational control, and budgeting becomes simple. Such easy access to accurate and real-time data assists decision-makers and improves an organisation's productivity.

Even though most interviewees saw the integration feature of the ERP system favourably, not everyone shared positive sentiments. For instance, the Senior Executive of Management Accounting emphasised that integration features can also be challenging, as all departments depend on each other for information. As she explained, if the procurement department does not update the material master data on time, it will affect the entire process of estimating product prices. She further pointed out, *"The management accounting department and the IT department work together to manage and improve the SAP system. When system modifications are needed, the management accounting department should contact the SAP lighthouse via the IT department."* Shedding further insights, the Head - IT clarified that if the firm is planning a project from scratch or intends to carry out significant modifications, this particular unit (SAP lighthouse) is responsible for estimating the cost and deciding on the configurations. Interviewees also revealed that configuring the system according to business requirements and reimplementing it is a challenging as well as a time-consuming process.

As the Head - Trade Marketing expressed, while Sugar & Salt was prompted to adopt the ERP system due to pressure emerging from the regional (Asian) office, in essence, the standard global system was imposed on the local (Sri Lankan) plant. As he elaborated:

> *"We are a multinational organisation. So, we had to implement the same global ERP system as other regional companies in the group. It wasn't aligned with our needs and wasn't fully catered for our local market. There were some features we did not necessarily need. That was a big challenge."*

On a comparable tone, the Sales & Distribution Manager highlighted issues that emerged due to the lack of similar experience on the part of the consultancy firm deployed. As he stated, *"... Company[3] which implemented the SAP system, did not have previous experience directly implementing from a manual to an SAP system, and in giving training in such an environment. So, it was a new experience for both organisations."*

In this manner, the ERP system of Sugar & Salt led to considerable benefits but was also fraught with challenges.

4.3 ERP implementation and management accounting change

The ERP system in the case study firm has brought in important implications on the role and skills of the management accountant and on management accounting systems, such as budgeting, costing, and internal reporting. However, an ERP system does not entirely change management accounting practices (Scapens & Jazayeri, 2003; Sánchez-Rodríguez & Spraakman, 2012; Malinić & Todorović, 2012), instead, facilitate practices to become more streamlined and efficient (Heinzelmann, 2018). This is elaborated next.

4.3.1 ERP and roles, skills of management accountants

A management accountant's work is premised on providing managerial insights for internal decision-making, and an ERP system has significant implications in this regard. Our field data revealed that to facilitate the ERP implementation process, Sugar & Salt formed a separate department which directly liaised with the consultancy team hired by the head office during the system configuration, testing, and implementation. It was evident that the management accountant was a key personnel in this team. Former Management Accounting Executive, a member involved in the implementation process, commented, *"We had a separate department for ERP system implementation. Around 20 people worked in the department, and I was one of the key personnel in this group."*

According to the insights gathered, the SAP system was integrated into the management accounting function. The ERP implementation brought significant changes to collecting, storing, processing, and disseminating data, as well as to management accountants' role, workload, tasks, and desired skills. For instance, with the SAP system, management accountants became less focused on data collection and more focused on value-adding tasks. Senior Executive of Management Accounting noted, *"... Since we could eliminate doing data entry activities, we got more time for analysing data. After SAP, management accountant's daily activities revolved around preparing internal reports for decision-making and data analysis."*

The Junior Executive of the Management Accounting department explained how the firm relies on the SAP system to collect and store more accurate information. She noted, *"With ERP, collecting data became more accurate, with fewer human errors, so we depend on the SAP system to get accurate information to perform our tasks."*. The Senior Management Accountant shared positive sentiments regarding the ERP system. As she explained, in the pre-ERP era, there was heavy use of paper and pen and high human intervention. With the ERP system, while supply chains enter resource-related information, line-level managers don't have to enter them manually, as the entries are automatically updated in the entire system. Expressing sentiments of caution, she added, *"when I get a calculation from the SAP system, I sometimes prepare a separate excel sheet to confirm the numbers, as we should not just depend on one system."*

Interviewees iterated that the automation of routine and repetitive data entry work powered by ERP has led management accountants to spend less time collecting and sorting data and more time analysing data and preparing reports for senior management's decision-making. Such a shift in management accountants' work from data collection to data analysis powered by ERP also calls for a novel skill set from accounting and non-accounting personnel. Our case study findings illustrate that all SAP end-users need to improve their technological skills to carry out their daily tasks. According to an interviewee from the management accounting area, management accountants need to acquire both IT skills and strategic knowledge alongside financial acumen to survive in modern manufacturing organisations, such as Sugar & Salt. She further elaborated that while management accountants are not expected to possess advanced technology skills as IT professionals, having basic technical awareness and computer literacy will give a competitive advantage. This was reinforced by another interviewee from the division who stated:

> *"Unlike those days, we management accountants now need to have some computer and technological skills. Management accountants' routine activities have shifted toward analysis and interpreting numbers, and around presenting summarised analysis to management."*

In this manner, in the post-ERP era, management accountants spend less time on data collection and more time on data analysis and have sharpened their technical knowledge and soft skills, spanning presentation, communication, and interpersonal skills.

4.3.2 ERP systems and implications on budgeting, costing, and internal reporting

This section uncovers how an ERP system gets implicated in various facets of management accounting, focusing on the case study organisation's budgeting, costing and internal reporting systems.

Within the area of management, accounting budgets occupy a central role, which is no exception in Sugar & Salt. Plausibly, in preparation of budgets and carrying out variance analysis, management accountants interact with various parties in accounting and non-accounting departments and units to gather necessary information. However, as our interviewees revealed, after the ERP system implementation, this task has become more accessible and less time-consuming. As a key person involved in this process, the Senior Executive of Management Accounting noted that rather than obtaining inputs individually from each person or department, currently, he uses the Controlling Module in the SAP system to collect and store data from different departments for budget preparation. In contrast, in the pre-ERP era, various departments of the firm had to liaise with each other to gather data. For instance, the management accounting department depends on their counterparts in sales and marketing for cost details. According to the evidence gathered, Sugar & Salt prepares two types of budgets: the ‘budget plan’, which is the one-year budget, and the ‘rolling estimate’, which is a short-term budget. While no alternations are made to the budget plan, the rolling estimates are altered in keeping with the external environment changes. Thus, various considerations in the macro and micro environment are factored into the preparation and revision of budgets. Interviewees further noted that the need to incorporate such a diversity of factors into the process had been the main barrier to fully integrating the budgeting system into the SAP system. An Executive of Management Accounting commented:

> *"The market is very volatile. For example, take covid. When there are sudden changes in the market, we cannot predict them, so it is difficult to integrate the budgeting process into the SAP system fully. When there are many unpredictable changes, it's more convenient to make changes to excel sheets compared to the SAP system."*

Another executive attached to the Management Accounting area contributed to the same point and highlighted that market volatility has been experienced during the past years due to various reasons such as the Easter-Sunday attack, floods, and the pandemic situation. He said, *"We need to adjust the budget according to the changes in the external environment. For example, with the lockdown, we had to adjust the sales forecast for the next months."* It was also revealed that even though Sugar & Salt cannot fully integrate its budgeting process with the SAP system, the budget management tools within SAP helped the firm streamline budgeting. This includes preparing more accurate budget plans, tracking and managing expenses and income by comparing with last year's actual volumes and prices, identifying variances, and compiling monthly reports. In this manner, the Controlling Module of the SAP system has facilitated budgeting.

Costing is another area that has been implicated with the ERP implementation. Interviewees highlighted the differences between the pre-ERP and the post-ERP costing system. According to the Senior Executive of Management Accounting, during the legacy costing system, recording costs and carrying out variance analysis to examine deviations between estimated and actual costs were carried out manually. While the firm used standard costing to prepare cost reports, cost-related data were derived from the bill of materials (BOM), starting from the procurement department and ending in the manufacturing department. With the implementation of the SAP system, the costing and reporting process has become much easier and accurate. As the Former Management Accounting Executive explained:

> *"The material management system includes prices of all raw materials. Our organisation has a lab, three production lines, and separate cost centres to service them. All these costs directly relate to daily production. Under the three production lines, we have labour costs, maintenance costs, and repair costs. Then there are cost centres that help the production engineering department and logistics. When calculating total costs, we need to absorb all these costs into a product. Before we had the ERP system, this was a complicated process, but after implementing ERP, we can now get accurate overhead absorption reports."*

He further elaborated:

> *"When calculating the total cost of a product, all these costs need to be allocated under that particular product... So, what happens under ERP is there is an automatic setup feature that automatically calculates the overhead absorption and the total production cost. There is no manual intervention."*

As interviewees explained, the Controlling Module in the SAP system has positively affected the costing system through accurate overhead absorption reports.

The ERP system of Sugar & Salt has also brought far-reaching implications in streamlining internal reporting. According to an interviewee from the management accounting area, the SAP system has relieved management accountants from routine report generation, giving them more time to focus on data analysis and internal reporting. As she highlighted, the SAP system has enabled broader visibility of costs to sub-elements through the drill-down feature. Furthermore, the ERP system has also facilitated the preparation of profit and loss (P&L) statements for internal reporting, keeping with regional guidelines by segregating costs into areas such as supply chain, HR, Finance, and marketing. One Management Accounting Executive revealed:

> *"We need to make a separate income statement and balance sheet for internal use. There is a different format for these reports as agreed by the countries in the South Asian region since we must compare our performance with other countries. Earlier, we used excel sheets to prepare them. Now we use ERP for such internal reporting."*

Another highlighted stating:

> *"Especially managers in the marketing department ask for more detailed information based on the external environment. So, with the ERP system now, we can give a more detailed and holistic picture since we have an accurate and in-depth database. Then they can make predictions on future trends and on what aspects the marketing campaign should be focused on ..."*

In light of the above evidence, it is apparent that the ERP system has relieved accountants from preparing certain routine reports, and paved the way for them to be more involved in data analysis drawing on an array of skills. Furthermore, internal reporting has been positively affected by the ERP system.

5. Discussion of findings

Drawing field study data from a manufacturing firm in Sri Lanka, Sugar & Salt, this paper portrays the motives for implementation, benefits and challenges, and the management accounting implications of an ERP system. Drawing on a longitudinal case study from a US-based multinational corporation, Scapens and Jazayeri (2003) illuminated how an ERP system facilitated the changes in management accounting which already took place in the division rather than directly influencing change. On a comparable tone, the words of interviewees highlighted that while drastic changes were not witnessed, the ERP implementation had positive consequences on the firm and the management accounting arena. Such management accounting implications were particularly seen in the areas of budgeting. For instance, budgets became more accurate and effective due to the close tracking of expenses and income, powered by the integrated database featured in the ERP system. Further, costing and internal reporting processes have become more precise, detailed and up-to-date in the post-ERP era. Similarly, past researchers have argued that budgeting and costing systems have improved subsequent to ERP implementations, with end-users able to access real-time and relevant data (Scapens & Jazayeri, 2003).

An ERP system integrates information across an organisation into a single system (Hooper, 2003), and facilitates internal reporting by generating flexible, divisional and regional reports (Granlund & Malmi, 2002). Modules in the SAP system help in reducing the time required to prepare financial reports whilst improving the accuracy and quality of information (Sánchez-Rodríguez & Spraakman, 2012; Ammar, 2017). Our empirical data lend support to such claims. In the context of Sugar & Salt, the automation feature of the SAP system has simplified the process of collecting data from multiple divisions, which involves creating a BOM, maintaining stock levels, tracking purchase orders, and calculating variances. Besides, based on an in-built feature of the SAP system, maintaining cost and profit centres is facilitated, enabling management accountants to compile more accurate overhead absorption reports.

Past literature has illuminated how the inherent characteristics of ERP systems, such as automation, integration, and real-time access have facilitated as well as changed the work of management accountants by providing an opportunity to shift from routinised tasks to data analysis and increased involvement in decision making (Chen *et al.,* 2012; Heinzelmann, 2018; Jabłoński *et al.,* 2018; Grabski *et al.,* 2009; Scapens & Jazayeri, 2003; Sánchez-Rodríguez & Spraakman, 2012; Dahal, 2019; Youssef & Mahama, 2021). For instance, the work of Sánchez-Rodríguez and Spraakman's (2012) revealed how an ERP system had enabled management accounting reports to become more accurate and timely while offering management accountants greater access to standardised information, enabling to shift more to financial analysis. Our findings from Sugar & Salt echo similar sentiments. It was evident that with the SAP implementation, management accountants could move away from data entry work and devote more time to value-adding and core management accounting-related tasks revolving around financial analysis and decision-making support. To step up to this new role, management accountants were also required to upskill themselves in presentation, interpersonal and communication skills, and technological knowledge.

While capturing data on a real-time basis through a single integrated and automated system is a salient feature of ERP (Ammar, 2017; Scapens and Jazayeri, 2003), such integration is not without limitations. As witnessed through the case of Sugar & Salt, integration between functions is challenging, for it increases dependency on other departments regarding internal reporting. A further challenge observed in the case study firm was the high reliance placed on SAP consultants due to the firm's lack of technical knowledge. Consequently, solving technical issues becomes a time-consuming task. Notwithstanding the above, on par with past literature (see Sánchez-Rodríguez & Spraakman 2012; Bravi *et al.,* 2021), the inherited benefits of the ERP system of Sugar & Salt outweigh the challenges and drawbacks.

From a theoretical stance, NIS espouses that adopting new management practices and information systems is largely influenced by external forces emerging from the macro environment (DiMaggio & Powell, 1983; Kholeif *et al.,* 2007). OlE illuminate the significance of internal drivers in the microenvironment (Burns & Scapens, 2000; Ribeiro & Scapens, 2006). On a comparable tone, insights afforded by these dual theories apply to the context of Sugar & Salt. Viewing from the perspective of NIS, the decision to implement an ERP system in the firm has been primarily influenced by external reasons, the mandate from the regional office and the corporate headquarters calling for the adoption of uniform practices among regional-level plants. In this manner, operating companies of multinational corporations become subjected to extensive pressures from the central management (headquarters and regional level), and the strategic decisions (such as ERP implementation) made by such entities get cascaded down to the local level through coercive pressures.

From an external front, competitive pressures emerging through the need to cater to increasing business growth and market competition prompted Sugar & Salt to engage in mimic behaviour and embrace competitors' practices, including ERP. The findings of this study also highlight how macro-level normative pressures led the firm to adopt industry standards and global practices, such as financial reporting and publishing standards, global code of conduct, and industry best practices, such as ERP implementations. From an internal front, amid the outdated legacy system, there was a need for accurate business insights through real-time information to improve efficiency, effectiveness and performance, as desired by the local management of Sugar & Salt. Hence lapses in the existing system became a compelling reason for ERP deployment. The ERP system appeared to be superior, and it appealed to the firm's managers. After the implementation, over time, it turned out to be a taken-for-granted practice within the organisation (Burns & Scapens, 2000). Resistance would understandably accompany change (such as a change to ERP) that threatens employees' comfort zone and regular behavioural patterns. However, stemming from such external and internal rationales for adoption, the ERP system in the case study firm accompanied minimum resistance. In this manner, through the use of NIS and OIE perspectives in combination (Ribeiro & Scapens, 2006), this paper illuminates how external (macro) and internal (micro) considerations influence the ERP implementation and the resulting management accounting ramifications in Sugar & Salt.

6. Conclusions, contributions, and directions for future research

This study concludes by elucidating rationales, benefits, challenges and management accounting ramifications of ERP systems implementation capitalising on an in-depth case study cascaded down to a multinational operating company from the manufacturing sector of Sri Lanka. Accordingly, it contributes to literature, theory, and practice.

ERP has attracted many positive connotations, and various facets of ERP systems have been subjected to scholarly inquiry. Seemingly, there is a dearth of in-depth studies on the sustained advantages and challenges of ERP systems and how such systems get implicated in the realm of management accounting in specific organisations. Given the contextual differences and the idiosyncrasies inherited in different organisational settings, an in-depth inquiry, as done through this research, is a valuable addition to the literature.

In illuminating how external and internal influences get intertwined in implementing ERP in organisations and delving into the ensuing management accounting consequences, this research brings together notions from NIS and OIE. Although appropriate, these dual theoretical lenses have not been the focus of related prior related research attempts. This study thus contributes by extending the body of management accounting research inspired by institutional theory and offers a holistic explanation of the phenomenon under study.

ERP implementation has posed several benefits and challenges for Sugar & Salt. The insights promulgated through this research are invaluable for practising managers striving to implement such practices in their organisations. Depicting a management accounting flavour, our findings elucidate the far-reaching consequences of ERP implementations on management accounting systems, especially on budgeting and costing systems, internal reporting and how ERP systems get implicated in the work of management accountants. It espouses that management accounting is a changing phenomenon and offers distinctive insights to practitioners. This research reminds practitioners that when organisations adopt new technologies (such as ERP systems), existing management accounting practices must also be changed and aligned to such adoptions.

This paper also provides directions for future research. We carried out this research as a single case study focusing on the motives underlying the adoption of the ERP system, its benefits and challenges and the interplay between ERP and management accounting. Potential researchers are encouraged to engage in multiple case studies and industry-specific studies, to shed comparative insights on this phenomenon. Longitudinal studies illuminating how ERP systems unfold over the long term are also worthy of study.

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Notes

1. If the organisation is planning a project from scratch (zero), then this unit is responsible for estimating the cost.
2. Relates to software or hardware that has been over-taken, but is difficult to be replaced due its wide use.
3. A South African company specialising in IT services, which provided consultancy and IT advisory services during the initial stages of the ERP implementation.