The CERA Project Presents:

SUPPLY CHAIN MANAGEMENT: PROCESS INNOVATION, PROCUREMENT & ERP

Leaders International

This paper comes as part of a series of whitepapers conducted under the Corporate Entrepreneurship Responsibility Alliance (CERA) project that are meant to raise awareness and spread knowledge on related topics under the project's mandate. The CERA project is funded by the Embassy of the Netherlands to Jordan and implemented by Leaders International. The project addresses the national imperative of promoting a transition in the enterprise ecosystem that would contribute to realising the growth potential of SMEs. It is focused on tackling one of the key constraints that face Jordanian enterprises, namely the availability and quality of local supply chains. The project will rely on supply chain requirements and internal procurement needs of larger enterprises and will build on the concept of Corporate Entrepreneurship Responsibility as an entry point to create an alliance committed to supporting the growth of the local industry in underserved regions of Jordan.

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Introduction

In today's rapidly evolving business landscape, supply chain management (SCM) has emerged as a crucial component for organisations striving to maintain competitiveness and drive innovation. With the rise of global interconnectivity and the capability to exchange data in real-time, companies are compelled to rethink their traditional business models and adapt to an increasingly complex market environment. This shift has intensified competition, urging firms to enhance their innovative potential and strategically align with internal and external stakeholders.

SCM encompasses a comprehensive network of processes that begins with procuring raw materials and culminates in delivering finished products to consumers. A well-integrated supply chain allows organisations to operate with agility, responding swiftly to customer demands while managing production and distribution efficiently. Especially as the dynamics of competition have shifted, making it essential for companies to strengthen their relationships with supply chain entities, including suppliers and customers.

As businesses navigate this new economy, characterised by the internet and globalisation, leveraging a network of partners and resources becomes paramount. By embracing advanced supply chain management practices, companies can mitigate risks associated with sourcing and distribution, ultimately gaining a competitive edge through cost, quality, flexibility, and responsiveness improvements. In this context, effective SCM enhances operational efficiency, fosters innovation, and drives exceptional value creation in a complex marketplace.

The primary goal of SCM, therefore, is to ensure that the right products are available at the right time and place while meeting customer demands efficiently. A key aspect of SCM is sharing information among various participants in the supply chain, which facilitates collaboration and coordination. This integration enhances overall performance and minimises risks, allowing decision-makers to access relevant data when needed and in a useful format.[1]

[1] Auramo et al., 2005

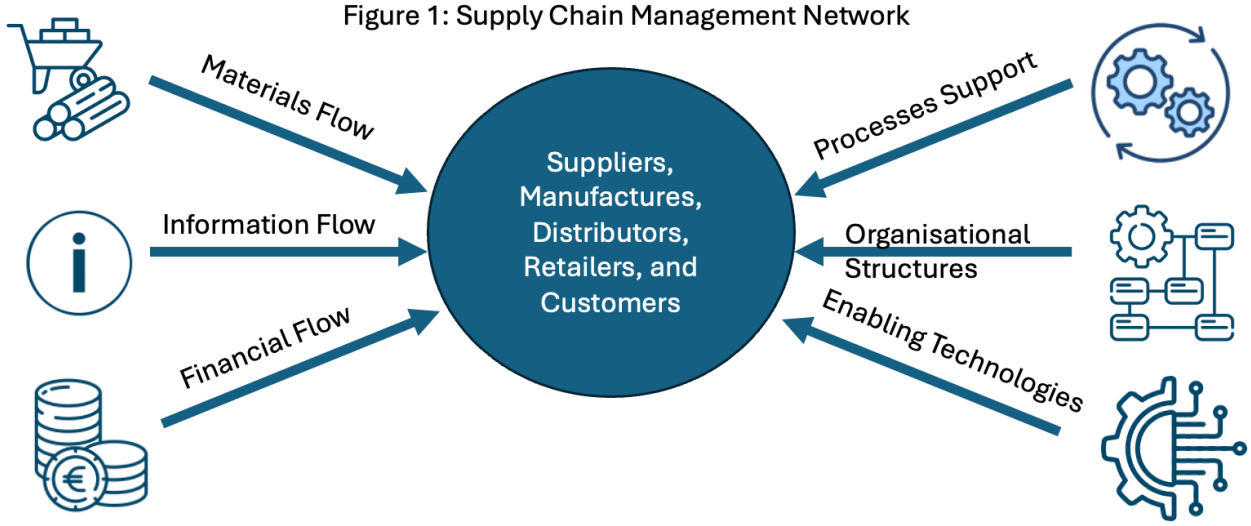
At the operational level, supply chains perform two main functions: the physical tasks of transforming, storing, and transporting goods and the market mediation tasks of balancing supply with demand.[2] Within this network, three key flows require careful planning and coordination. Material flows involve the movement of physical products as well as reverse logistics for returns and recycling. Information flows consist of order transmission and tracking, which are essential for coordinating the physical flows. Financial flows include elements such as credit terms, payment schedules, and arrangements related to ownership.[3]

Information Technology (IT) plays an additional and essential role in SCM, performing several critical functions. These include transaction execution, which ensures that processes are carried out smoothly; collaboration and coordination among different supply chain members; and decision support, which provides the necessary insights for informed decision-making. IT systems contribute to better alignment of supply and demand through features such as data integrity, real-time availability, and processing capabilities. Such technologies create a robust foundation for seamless integration within the supply chain and external partners.[4]

Lastly, the effectiveness of a supply chain network hinges on three main supporting pillars. First, processes are crucial as they embed a firm's capabilities in areas such as logistics and new product development. Second, organisational structures establish the relationships among companies, ranging from total vertical integration to entirely networked operations. Finally, enabling technologies—including both process and information technologies—facilitate the seamless movement of materials, information, and finances across the supply chain. In summary, effective supply chain management is critical for achieving operational excellence and ensuring customer satisfaction in today's interconnected business landscape. The figure below offers a screenshot of the anticipated network structure, support functions, and flow required.

[2] Fisher 1997
[3] Akkermans et al., 2003
[4] Tarn et al., 2002

Figure 1: Supply Chain Management Network



The Importance of Enhancing Supply Chain Management

Enhancing supply chain management (SCM) is increasingly critical for companies. As businesses face challenging requirements and an evolving market, the need to find new sources of competitiveness becomes paramount. One approach is to engage in the creation of knowledge and innovation, which can provide a significant strategic advantage. This involves developing capabilities internally and in collaboration with other organisations.[5]

The evolution of technology, particularly the emergence of e-Supply Chain Management (e-SCM), underscores this importance. As information technologies have advanced, e-SCM has evolved from traditional SCM to facilitate closer digital collaboration among supply chain partners. This shift allows organisations to connect efficiently, leveraging intelligent systems and digital networks.[6]

[5] Soosay et al., 2008
[6] Pulevska-Ivanovska & Kaleshovska, 2013

By enhancing SCM through e-SCM systems, companies can improve their overall performance. These systems enable better planning and forecasting, streamlined procurement processes, more efficient logistics, and improved information sharing. The integration of Internet and IT technologies plays a crucial role in these enhancements, allowing firms to respond swiftly to market changes and customer demands. Therefore, enhancing supply chain management is essential for firms looking to maintain competitiveness in a rapidly changing market. By embracing e-SCM and fostering collaboration beyond their organisational boundaries, companies can tap into external resources and capabilities, ultimately driving knowledge creation and innovation.

How to Incorporate Innovation in SCM

To incorporate innovation in supply chain management, companies should start by assessing their current practices. This involves identifying areas within the supply chain where improvements or changes can be made. Understanding the existing processes helps recognise potential opportunities for innovation.

Next, companies can introduce new methods that have not been previously utilised. This could include changes in production, supply, or distribution techniques. By adopting these new approaches, businesses can enhance their operational efficiency and better meet market demands.[7]

Another critical step is to enhance relationships with suppliers. Building long-term partnerships focused on new product development, improving service quality, and exchanging innovative ideas can significantly impact the supply chain's success. Collaboration with suppliers fosters an environment where innovation can thrive.[8]

Finally, it is essential to focus on value creation. Any changes implemented in the supply chain should aim to create new value for the company and its customers. By keeping value creation

[7] Ulusoy 2003
[8] Siagian et al., 2022

at the forefront of innovation efforts, companies can ensure that their supply chain management remains competitive and effective.

The role of procurement

The role of procurement in supply chain management is increasingly recognised as both strategic and innovative. Traditionally viewed as a function focused on acquiring goods and services, procurement is evolving into a critical interface that influences broader organisational goals, including efficiency, effectiveness, and profitability.[9]

Procurement is transitioning from a transactional role to one that actively contributes to organisational strategy. As companies seek to adapt to changing markets, procurement can help shape new business models and services, making it a vital part of the supply chain ecosystem.[10]

One of the primary roles of procurement is to reduce costs while enhancing competitiveness. Effective procurement strategies can lead to significant savings, enabling organisations to operate more efficiently and remain agile in a competitive landscape.[11]

The digitisation of procurement processes is pivotal to unlocking numerous benefits. Procurement teams can focus more on strategic decision-making by automating daily business and administrative tasks. This shift allows procurement professionals to engage more meaningfully in activities that drive innovation and support the overall supply chain.[12]

The use of platforms for “end-to-end” collaboration enhances communication and coordination among various stakeholders in the supply chain. Tools that facilitate “many-to-many” communication are also essential for improving transaction speed, fostering creativity, and leveraging intelligence across different functions and departments.[13]

[9] Bienhaus and Haddud, 2018
[10] ibid
[11] ibid
[12] ibid
[13] Bienhaus and Haddud, 2018

Finally, procurement can facilitate the creation of new products and services by establishing connections within the supply chain that promote innovation. By actively engaging suppliers and stakeholders in collaborative processes, procurement can drive the development of cutting-edge solutions that respond to market demands.

The transition to innovative procurement

The transition to innovative procurement reflects a fundamental shift in how organisations approach and manage their relationships with suppliers. In traditional buyer-supplier dynamics, trust plays a crucial role, largely stemming from direct interactions between the two parties and influenced by external factors. However, maintaining mutual trust becomes increasingly challenging as supply chains evolve into more intricate ecosystems involving multiple stakeholders. This necessitates a significant cultural shift within organisations to adapt to this new collaborative environment.[14]

The integration of advanced technologies such as Artificial Intelligence, Big Data, and the Internet of Things is central to this transition. These innovations enable the automation of routine procurement activities, allowing companies to refocus their efforts on more strategic initiatives that require human insight and creativity. This shift not only enhances efficiency but also creates opportunities for organisations to innovate their processes.[15]

E-procurement is highlighted as a vital catalyst for this transformation. It offers management tools that can boost profitability and competitiveness thanks to streamlined processes and cost reductions. However, leveraging e-procurement effectively demands advanced managerial skills, especially when navigating the complexities introduced by innovative technologies. The influence of competitive pressures and regulatory frameworks further

[14] Harshak et al., 2013
[15] Bienhaus and Haddud, 2018

emphasises the necessity of adapting to these changes to facilitate widespread adoption among business stakeholders.[16]

Moreover, successful implementation of e-procurement requires substantial investment in resources, which translates to changes in organisational structures, practices, and daily routines.[17] Top management plays a pivotal role in championing these changes by communicating the benefits of e-procurement, including faster purchasing processes, improved supplier relationships, and enhanced competitive advantages.[18] The transition to innovative procurement involves embracing advanced technologies, fostering trust in a multi-party environment, addressing cybersecurity risks, and committing to significant changes in organisational practices to improve efficiency and profitability.

The Innovative Supply Chain

The innovative supply chain represents a transformative approach to how companies manage their operations. It emphasises the integration of advanced information and communication technologies (ICT) to enhance the flow of data and facilitate better coordination among supply chain members.[19]

One key aspect of the innovative supply chain is its reliance on new methodologies and tools that have not been previously utilised in businesses. These practices are specifically designed to address various supply chain challenges, including quality control, cost efficiency, and lead time reductions.[20] By implementing such practices, companies can leverage innovations such as logistics network reconfiguration and outsourcing various functions, helping them optimise their operations and create significant value for their customers.

[16] Marei, A. et al. (2021)
[17] ibid
[18] Yigitbasioglu, 2015
[19] Markides & Anderson, 2006
[20] Lavastre et al. 2011

Additionally, the role of top management is crucial in promoting the value of innovative practices like e-procurement.[21] By motivating employees and fostering a culture that embraces change, organisations can enhance the purchasing process, improve relationships with business partners, and ultimately achieve a competitive advantage. This holistic approach leads to cost savings and contributes to a more agile and responsive supply chain.[22]

Overall, the innovative supply chain is characterised by its ability to adapt and evolve, utilising advanced technology and innovative practices to enhance overall performance and customer satisfaction.

Steps to an Innovative Supply Chain

The steps to an innovative supply chain are as follows:[23]

1. **Learning Phase**: This phase emphasises interactions and communication among supply chain members to foster learning. It involves absorbing knowledge and insights from both internal team members and external entities.[24]

2. **Innovation and Execution Phase:** This involves utilising the knowledge gained during the learning phase to design and implement innovative solutions. This includes the practical application of learned insights to enhance processes and develop new strategies.

3. **Outcomes Phase:** The last phase focuses on achieving new value and a prospective competitive advantage. This phase assesses the impact of the innovations implemented and their contributions to the firm's performance, including quality, efficiency, and effectiveness.

[21] Yigitbasioglu, 2015
[22] Chan & Qi, 2003
[23] Yazdanparast et al., 2010
[24] Szuster and Szymczak, 2016

Additional considerations involve leveraging external knowledge sources and employing various information and knowledge management models, methods, and tools to strengthen the knowledge base of the supply chain.[25]

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) systems are integral to the effective management of modern business operations, providing a unified platform that integrates core organisational processes. As businesses face increasing competition and complexity in their operations, ERP solutions emerge as a powerful tool to enhance efficiency, optimise resources, and drive strategic decision-making across departments.[26]

At its core, an ERP system is a software solution that consolidates various business functions—such as finance, human resources, sales, inventory management, and manufacturing—into a single, cohesive framework.[27] This integration allows different departments to communicate and share data seamlessly, fostering collaboration and ensuring that all team members are working with the most accurate and up-to-date information.

A crucial feature of ERP systems is the centralised database. This component provides a real-time repository of data that all departments can access.[28] For instance, the sales team can view current inventory levels, allowing them to make informed commitments to customers regarding product availability and delivery timelines. Meanwhile, the finance department can monitor expenses and revenue in real time, leading to more accurate budgeting and financial forecasting.[29] This centralisation minimises the risk of data silos and ensures that every department is aligned toward common organisational goals.

[25] Szuster and Szymczak, 2016
[26] Mohamed, 2002
[27] Hwang & Min, 2015
[28] Brady et al., 2001
[29] Mabert et al., 2013

One of the most significant benefits of ERP systems is their ability to automate various routine tasks. By automating processes such as order processing, invoicing, payroll management, and procurement, organisations can drastically reduce the time and labour involved in these functions.[30] Automation decreases the likelihood of human errors, streamlines operations, and increases reliability in day-to-day tasks. For example, invoicing can be initiated automatically based on sales data, allowing for quicker cash flow and reduced administrative burden. This efficiency saves time and frees employees to focus on more strategic roles, driving innovation and growth.

In today's fast-paced and ever-changing business environment, adaptability is critical. ERP systems enhance organisational agility by providing the insights necessary for quick and informed decision-making. Real-time data access allows managers and executives to swiftly assess market trends, customer demands, and operational performance. This capability enables businesses to pivot their strategies, adjust production levels, and enhance customer service in response to changing conditions, thus maintaining a competitive edge.

Another essential aspect of ERP systems is their robust reporting and analytics functionality. These tools enable businesses to analyse data across various functions, identifying trends, inefficiencies, and opportunities for improvement.[31] By leveraging comprehensive reporting capabilities, organisations can conduct in-depth analyses of their operations, generate performance metrics, and create forecasts that guide strategic planning. For instance, a manufacturer might analyse production data to identify bottlenecks and streamline workflows, ultimately leading to enhanced productivity and cost savings.

The advent of cloud technology has further revolutionised the ERP landscape. Cloud-based ERP solutions offer businesses increased flexibility and accessibility, allowing employees to access the system from anywhere with an internet connection. This mobility is particularly beneficial for organisations with remote workforces or those that operate in multiple locations. Additionally, cloud ERP solutions typically involve lower upfront costs compared to traditional

[30] Hwang & Min, 2015
[31] Brady et al., 2001

on-premises systems, using subscription-based models that facilitate predictable budgeting and scalability.

ERP systems also foster a culture of continuous improvement within organisations. By facilitating the collection and analysis of operational data, these systems encourage businesses to assess and refine their processes regularly. This ongoing optimisation allows organisations to introduce innovations, improve customer satisfaction, and stay ahead of market trends.[32] This means that Enterprise Resource Planning (ERP) systems are essential tools for enhancing business efficiency and operational effectiveness. By integrating key functions, automating processes, and providing real-time data access, ERP solutions empower organisations to respond to market dynamics and improve decision-making. As technology advances, ERP systems' capabilities will evolve, making them even more indispensable for businesses looking to thrive in an increasingly complex and interconnected world. Investing in an ERP system is not just about improving current operations; it's about positioning the organisation for future success and competitive advantage.

Figure 2 ERP Systems Functionality

Feature	Description	Benefits
Transaction Processing Engine	Integrated management of data throughout the enterprise.	Streamlined data handling and improved accuracy across departments.
Workflow Management Functions	Controls various process flows such as order-to-cash and purchasing.	Enhanced operational efficiency and visibility across processes.
Decision Support Functions	Assists in planning and decision-making (e.g., MRP runs, ATP checks).	Informed decision-making leads to better resource management and customer service.

[32] Mohamed, 2002

Integration of Legacy Systems	Replaces outdated and non-integrated systems with modern, maintainable ERP software.	Improved system efficiency and reduced maintenance costs.
Enterprise Transaction Backbone	Acts as a link between best-of-breed solutions, maximising the ROI of these investments.	Optimised integration and better performance across systems.
Transformation to Process Orientation	Encourages thinking in terms of processes rather than departments, fostering better communication and collaboration.	Enhanced collaboration and communication across teams.

Factors of Success & Failure of ERP

Various factors influence the success and failure of ERP (Enterprise Resource Planning) implementation. One of the most critical factors for success is top management commitment. Strong support from top management ensures that adequate resources are allocated to the project and that it aligns with the organisation's strategic goals.[33] Effective project management is also essential, as it coordinates various aspects of implementation and helps keep the project on schedule and within budget.

Organisational culture plays a significant role as well. An adaptive culture that embraces change can facilitate a smoother transition during ERP implementation. Additionally, data accuracy is fundamental to the effectiveness of ERP systems, as they rely on high-quality information for optimal function.[34] Investing in user training and education enhances proficiency, leading to better system utilisation and higher productivity.[35] Engaging users in the planning and

[33] Hwang & Min, 2015
[34] ibid
[35] ibid

implementation process fosters a sense of ownership and ensures that the system meets their needs. Furthermore, strong support from ERP software vendors provides necessary guidance and troubleshooting, encouraging successful usage. Finally, when users perceive the ERP system as beneficial and user-friendly, they are more likely to engage fully with it.

On the other hand, several factors can lead to the failure of ERP implementations. A lack of top management support can be detrimental, as the withdrawal of critical resources may negatively affect the project. Resistance to change within the organisational culture can also hinder the adoption of new systems and processes. Poor data quality, characterised by inaccuracies or incompleteness, can lead to flawed insights and decision-making, ultimately undermining the system's effectiveness.

Inadequate training poses another risk; users who do not receive sufficient training may misunderstand or underutilise the system, reducing the realised benefits. Limited user involvement in the implementation process can result in unmet needs, causing dissatisfaction and poor adoption rates. Insufficient infrastructure for ICT (Information and Communication Technology) can create roadblocks that hinder successful implementation. Lastly, if the ERP system does not align with the organisation’s strategic objectives, it may fail to deliver the expected benefits.

Careful consideration of these success and failure factors can significantly enhance the likelihood of successful ERP implementation while helping to avoid common pitfalls that can lead to failure.

Jordan: The need for accelerated enhancement

Jordan's journey towards adopting e-procurement and integrated management systems has witnessed both progress and significant challenges. While there are successful examples that highlight the potential benefits of these systems, the overall adoption rate remains limited. The Ministry of Information and Communications Technology reported in 2021 that only 27.6% of businesses in the country are utilising e-procurement systems, suggesting a need for strategic acceleration in this area.[36]

The broader spectrum of Jordanian industrial companies indicates a complex landscape. While these companies feature the essential components of ERP, they often struggle with integration deficiencies, particularly in knowledge management (KM) and business intelligence (BI).[37] Notably, the integration of BI is critical; its low presence suggests that companies lack the analytical strategies necessary to leverage their data effectively. This gap points to a vital area for enhancement, as fostering analytical capabilities can significantly improve decision-making processes and operational performance.

Cultural factors also influence the slow adoption rates of innovative systems like e-supply chain management (e-SCM). Studies have identified high uncertainty avoidance as a cultural barrier, causing hesitance among businesses in adopting complex systems.[38] This is especially true as enterprises deal with suppliers and vendors based on established personal relationships and the provision of decades of trust. Thus, they may find some processes redundant in this long-term semi-smooth relationship. This insight underlines the need for organisations to enhance their readiness through management support and the development of employee competencies, which are crucial enablers for successful implementation.

[36] Marei, A. et al. 2021
[37] Chan et al., 2014
[38] Hamadneh, 2023

Furthermore, external pressures from competition and customer expectations could serve as powerful motivators to increase adoption rates. Larger companies in Jordan have experienced success in overcoming trust issues within their supply chains by implementing ERP systems, which help track inventories and manage operations efficiently.[39] This is in stark contrast to SMEs, which, due to poorer quality controls, may struggle to deliver optimal services, revealing a significant disparity that necessitates urgent attention.[40]

The implications of these findings are clear: for Jordanian companies, particularly SMEs, to improve their operational efficacy and remain competitive, there is a pressing need to accelerate the implementation of integrated systems like ERP and e-procurement. By addressing cultural barriers, enhancing organisational readiness, and leveraging external pressures, Jordan can unlock the full benefits of technological investment.

In conclusion, while there are commendable examples of successful technology adoption in Jordan, the necessity for a widespread acceleration in the integration of e-procurement and management systems is paramount. By addressing the existing gaps in knowledge management, fostering a supportive culture, and responding to external market pressures, Jordan can enhance its industrial capabilities and ensure sustainable growth in the competitive landscape.

[39] Mazzawi & Alawamleh, 2019
[40] ibid

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