THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES

Business Administration Doctoral School

PhD THESIS

Presented and publicly supported by the author:

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PhD thesis title:

RESEARCH ON SUPPLY CHAIN OPTIMIZATION IN THE CONTEXT OF GLOBAL RISKS AND REQUIREMENTS FOR SUSTAINABLE DEVELOPMENT

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Bucharest, 2024

a) Content:

CONTENT

b) KEYWORDS:

Global supply chain, sustainable and responsible supply chain, supply chain 4.0, global risks, sustainable development, circular supply chain, integrated lean and agile supply chain model, method to optimize the supply chain, integrated management system for quality, environment, health, and safety, sustainable business model, sustainable procurement, chemical sector in Morocco.

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c) SUMMARY:

The doctoral thesis highlights an in-depth understanding of integrated lean and agile supply chain models to adopt flexible and integrated strategies for effectively managing the complexity and uncertainty of the current market. By combining lean and agile approaches in a supply chain, the aim is to maximize performance and competitiveness while ensuring responsiveness and adaptability to changing needs. The thesis emphasizes the importance of artificial intelligence (AI), digitalization, and sustainable practices to enhance value chain performance and address contemporary challenges related to sustainable development.

A particular focus has been placed on the management of spare parts and replacement equipment. Efficient management of these elements minimizes costs and ensures the operational continuity of the value chain, whereas poor management can threaten viability by creating financial burdens that are difficult to recover throughout the value chain. Recommendations for optimization include stock control, planning, preparation, forecasting techniques, and reordering management. The role of modern Enterprise Resource Planning (ERP) systems, incorporating technologies such as the cloud, AI, and the Internet of Things (IoT), is highlighted for increased flexibility and predictive analytics to address challenges related to integration, customization, and change resistance.

A chapter on the importance of value chain sustainability has been developed, emphasizing its critical role in supply chain performance. Corporate Social Responsibility (CSR), with environmental, social, and governance (ESG) criteria, becomes essential for evaluating overall company performance. Adopting sustainable practices through stakeholder collaboration is crucial for improving supply chain performance. Technological innovations such as Industry 4.0, blockchain, and IoT play a key role in enhancing sustainable performance. The strategic and significant role of the purchasing function supports this sustainability perspective through collaboration and mutual trust with sustainable suppliers selected based on strategic criteria.

To achieve complete integration, specific aspects of quality, environmental, health, and safety management systems were considered, analyzing the models proposed by international standards ISO 9000, ISO 14000, and ISO 45000. Key characteristics and benefits of integrated management systems, integration models proposed in the literature, and requirements for addressing sustainable development within management system models were examined.

Performance improvements in the supply chain, in the context of sustainable development, were identified through the implementation of innovative approaches based on new technologies. This includes maintenance 4.0, the integration of Industry 4.0 technologies, and the adoption of advanced tracking and tracing systems. A particular focus was placed on maintenance, replacement equipment management, and loss analysis to reduce waste and improve operational performance, integrating lean and agile approaches. Effective maintenance planning ensures equipment availability, while poor planning can result in costly unexpected downtimes. Investment costs (CAPEX) and operational expenses (OPEX) are evaluated to measure the performance of production facilities. The integration of preventive and predictive maintenance practices, supported by IoT technologies, was highlighted for real-time equipment availability monitoring and fault anticipation, optimizing operational expenses.

In parallel, the integration of information technologies (IoT, MES, MOM) improves operational flexibility and synergy, enabling more effective real-time data management. An innovative solution proposed by the research addresses the lack of traceability and visibility of equipment in the context of indoor and outdoor maintenance (integrated solution) within a large industrial company in Morocco, launched as part of a digital transformation initiative. A pilot implementation on a dozen pieces of equipment tested the relevance and managed potential improvements concerning replacement processes, stock management, and repair management regardless of the scope.

The solution involves equipping the equipment with IoT sensors connected to an IT platform via the LTEM network (first implementation in Africa). The solution has been tested and provided satisfactory results with significant improvements. The industrial company plans to scale up the implementation to a broader scope. The prospects of the solution include the implementation of a digital twin between internal and operational technologies based on Industry 4.0 information models to enhance smart factory capabilities. The Supply Chain 4.0, using advanced technologies such as cyber-physical systems (CPS) and IoT, will allow modeling customer behavior, optimizing stocks, and increasing real-time production capacities. Adopting advanced technologies like IoT and blockchain improves operational traceability and transparency, enabling more effective information and product flow management. Real-time traceability systems and advanced tracking technologies (RFID, GPS) allow monitoring shipments and goods status. Collaboration with supply chain partners and real-time data analysis facilitate proactive and optimized management of stocks and maintenance operations.

The last chapter emphasizes the overall positive influence of digitalization on purchasing. Sustainable and digital purchases have mainly been studied separately, with sustainable purchases focusing on social and environmental aspects and digital purchases emphasizing economic factors. However, common strategies have been identified to align these two paradigms. Industry 4.0 technologies, such as Robotic Process Automation (RPA), Artificial Intelligence (AI), and Blockchain, are seen as potential drivers for sustainable manufacturing practices.

Sustainable business models (SBMs) represent a strategic roadmap for companies aiming to innovate sustainably. By investing in research and development, standardizing production processes, and integrating sustainable practices, companies can enhance their competitiveness while positively contributing to environmental and societal protection.

The SBM model proposed in this chapter originates from a pilot project conducted within an industrial company operating in the chemical sector in Morocco. Titled "waste management solution 4.0," this project addresses the challenges of solid waste management, particularly the lack of traceability and visibility, leading to inefficient management.

To resolve these issues, the project proposes an intelligent and sustainable waste management solution based on new 4.0 technologies (IoT sensors and a cloud platform with AI). This integrated process covers the entire lifecycle of solid waste, from recovery to final destination, incorporating strategies such as source reduction, reuse, and recycling. This process will allow:

Better compliance with sustainability requirements, including waste reduction, improvement of reduction, reuse, and recycling,

- Historical data and field information reporting on waste,
- Better coordination among stakeholders,
- Optimization of the waste lifecycle through processes based on sustainable strategies.

Currently in the testing phase, this project is part of an intrapreneurial initiative sponsored by the company due to the initial test results and the improvements it presents. The results obtained in the doctoral research can serve as a starting point for future research, providing models of good practices for the implementation of a fully integrated management system. Supported by concrete models already tested and used in industrial companies, this system allows for improved company performance in line with sustainable development requirements.

d) CURRICULUM VITAE

europass *Curriculum Vitae*

PERSONAL DETAILS

✉ hassani.youssri@gmail.com

Date de naissance: 28/09/1982

PROFESSIONAL EXPERIENCE

01/04/2014 – present: Local manager for general resources and logistics in the value chain.
OFFICE CHÉRIFIEN DES PHOSPHATES, MAROC

Oversee and manage the procurement and supply processes within the maintenance framework to ensure timely and efficient support, Handle the inventory management for replacement equipment, ensuring optimal stock levels and availability to minimize downtime, Manage contracts, monitor and control OPEX (Operational Expenditures) and CAPEX (Capital Expenditures) to ensure budget adherence and cost-effectiveness, Lead initiatives to improve the performance of the support chain, identifying areas for enhancement and implementing effective solutions, Implement digital transformation and industrial innovation projects to modernize processes and improve operational efficiency, Govern Quality, Health, Safety, and Environment (QHSE) practices, ensuring compliance with industry standards and fostering a culture of safety and quality within the organization

17/10/2009 – 01/04/2014: Project and Logistics Procurement Officer (Technical & Methods)
OFFICE CHÉRIFIEN DES PHOSPHATES, MAROC

Responsible for the management, administration, and supervision ,In charge of the contracting services and manage the purchase of supplies, equipment, and materials,Source goods and services, and to negotiate prices and contracts,Locating sources for supplies and services, and ofmaintaining relations with suppliers and vendors.

17/02/2008 – 17/10/2009: Project Manager for Implementation and Construction Works (Technical & Methods)
OFFICE CHÉRIFIEN DES PHOSPHATES, MAROC

Responsible for setting up work schedules, project work management, client relations, and preparing quality reports.

01/06/2007 – 17/02/2008: Supervisor administrative framework
OFFICE CHÉRIFIEN DES PHOSPHATES, MAROC

Preparation of maintenance schedules, planning of maintenance,Approvisioner PDR (spare parts), Store Manager spare parts and Warehouse

EDUCATION AND TRAINING

01/10/2015 – Present: PhD Student – Business Administration
THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES,

BUCHAREST, ROMANIA

01/07/2012 – 12/11/2012
Diploma in Customs Declaration, Transport, and Logistics
INSTITUTE OF CUSTOMS DECLARATION AND TRANSPORT LOGISTICS, CASABLANCA, MOROCCO
In-depth training in customs regulations, transport document management, and logistics chain optimization. This program includes modules on customs clearance procedures, international trade legislation, and modern logistics techniques, ensuring a comprehensive mastery of customs and logistics processes for a successful career in international transit.

01/10/2010 – 31/05/2012
MBA Degree: International Procurement and Logistics
INSTITUTE OF ADVANCED ECONOMIC AND COMMERCIAL STUDIES, PARIS, FRANCE
Training focused on mastering international procurement strategies and logistics management. The program covers key areas such as international negotiation, supply management, global logistics chain, and risk management. Students acquire practical and strategic skills to optimize procurement and logistics processes, strengthen supplier relationships, and ensure the efficiency and sustainability of international operations.

14/10/2009 – 14/07/2012
Bachelor's Degree in Logistics Management and Integrated Production
UNIVERSITY OF AUVERGNE - PROFESSIONAL UNIVERSITY INSTITUTE, CLERMONT-FERRAND, FRANCE
Training focused on supply chain management and industrial production. It covers essential areas such as procurement, inventory management, production planning, flow management, and process optimization. Students acquire skills in logistics, project management, quality control, and the use of information technologies for logistics. This program prepares graduates to meet the challenges of the industrial sector and improve the operational efficiency of companies.

01/10/2003 – 01/06/2005
University Degree in Technology in Mechanical and Production Engineering
HIGH SCHOOL OF TECHNOLOGY, FES, MOROCCO
Technical and practical training focused on the design, manufacturing, and maintenance of mechanical systems. Students acquire skills in industrial drawing, 3D modeling, machining, and production management. This program prepares graduates to quickly integrate into the industrial sector, providing them with the necessary tools to optimize production processes and improve the performance of mechanical systems.

PERSONAL COMPETENCIES

Mother tongue: Arabic

	UNDERSTANDING		SPEAKING		WRITING
	Listening proficiency	Reading proficiency	Conversational proficiency	Free speach proficiency	
Français(second mother tongue)	C1	C1	B1	B1	B2
Angalais (études)	B2	B2	B1	B1	B2

Competencies achieved at working places

- Project Procurement, Purchasing and Logistics Officer
- Certification ISO 9001/ISO 14001/ISO 45001
- Improvement of support chain performance
- Implementation of digital transformation projects
- Implementation of intrapreneurial projects for sustainable models

Other competencies

- Analytical and synthesis skills
- Project management
- Organizational capacity
- Research skills

Driving License B , C

Date: 26/07/2024 **Signature**