

Report On
DIGITAL TRANSFORMATION OF SUPPLY CHAIN MANGEMENT
A STUDY ON AKIJ CEMENT CO. LTD.

By
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An internship report submitted to the Department of BRAC Institute of Governance and Development in partial fulfillment of the requirements for the degree of Masters in Procurement & Supply Management (MPSM)

BRAC Institute of Governance and Development
BRAC University
June, 2021

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at BRAC University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

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Ethics Statement

This report ensures that the first principle is met, in which all interviewees are informed of the purpose of the investigation prior to the interview. Additionally, all interviewees participated in the survey at their own choice by asking whether they would agree to the survey and interview. The other is confidential. This means that the collected data needs to be treated confidentially. This means that the information and data collected cannot be shared freely, and there may be a need to anonymize businesses or organizations.

Supervisor Authorization

I, the undersigned, sincerely state that the project report is based on my own work performed during the course of our study under the supervisor of Md. Zikrul Islam Sir (academic) and Md. Abdullah Al Masud sir (Work Place). I affirm that the statements made and the conclusions drawn are the result of my report work. I further certify that,

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2. The work has not been showed to any other institution for any other degree / diploma / certificate in this university or any other university in Bangladesh.
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Letter of Transmittal

Date: 30th April, 2021

Md. Zikrul Islam (MCIPS, PMP)

Executive Engineer (Project Manager) and Faculty (Part-time) at BRAC University

Subject: Submission of report for the “Digital Transformation of Supply Chain Management” A Study on Akij Cement Co. Ltd.

Dear Sir,

I would like to declare that I have completed my report on the “Digital Transformation of Supply Chain Management” at Akij Cement Co. Ltd (ACCL) as a part of my MPSM program. It has been great contentment for me to have the opportunity to apply my academic knowledge in practical field. The report was prepared based on the theoretical and practical learning on my job station from last six months.

I have tried my level best to put meticulous efforts into preparation of this report. I think the report will give you at least a brief overview on the subject, which will also show that I have gained valuable experience through this report under your insightful supervision.

Thank you for inspiring me to work on this subject. Kindly accept my report and please do so.

Sincerely Yours



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Non-Disclosure Agreement

This nondisclosure agreement (The "Agreement") come into by and between your principal Debashish Debnath, Designation - Asst. Manager (Planning & Implementation), Akij Group with BRAC University, located at 66 Mohakhali, Dhaka 1212, Bangladesh for preventing the unauthorized disclosure of confidential information as defined below.

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Executive Summary

Digital innovation has affected every aspect of a company's business, including the supply chain and other operating models. Today, with technologies such as RFID, GPS, AI, cloud computing and sensors, organizations can transform their existing hybrid (paper-based and IT support process combination) supply chain management structures into a more versatile, open and fast collaboration digital complete. It can be converted to an automated model. Unlike the hybrid supply chain management model, which results in rigid organizations and business structures, inaccessible information and data, and fragmented relationships with partners, digitally transformed supply chains automate business processes and structure. Allows flexibility and digital management of company assets. So, for the rapping most advantages and others benefit from digital supply chain models, it is a vital issue that companies internalize it as an integral part of the business model and for the organization structure. Localized fragmented businesses and silo-based operations pose serious threats to competitiveness in an increasingly digital world.

Digitization is a new phenomenon that will bring major changes to the cement industry. Digitization is changing the way organizations manage their day-to-day supply chain processes.

This report is based on a qualitative case study research method for gaining an understanding of a new phenomenon. Four topics: digital supplier chain development, supply chain digitalization, and current practice for the digital supply chain in Akij Cement Co. Ltd.

Keywords: Digitalization; Digital Supply Chain; Lean; Global Firms; Digital Strategy, Supply chain management, supplier partnership, customer relationship, environment, information communication technology, SCM performance

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I cannot stay without giving thanks to Md. Mortuza Kashem sir and others of Akij Group. He really helps me a lot by providing valuable information.

I am glad to my university, for that I am standing here to earn my Master Degree successfully.

Sincerely Yours



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Table of Contents

Declaration	(i)
Approval	(ii)
Ethics	(iii)
Supervisor Authorization	(iv)
Letter of transmittal	(v)
Non-Disclosure Agreement	(vi)
Executive Summary	(vii)
Acknowledgements	(viii)
Table of Contents	(ix, x & xi)
List of Figures	(xii & xiii)
List of Tables	(xiv)
List of Acronyms	(xv)
Glossary	(xvi & xvii)
Chapter I: Introduction	
1.1 Background	1
1.2 Objectives of the Study	2
1.3 Research Questions	2
1.4 Delimitation and Limitations	2
1.5 Background of the Organization	3
1.6 Mission of ACCL	5
1.7 Vision of ACCL	5
1.8 Values of ACCL	5
1.9 Product/Services of ACCL	5
1.10 Levels of Organizational Strategy	5
1.10.1 Corporate Strategies	6
1.10.1 Business Levels Strategies	6
1.10.1 Functional Strategies	6
Chapter II: Methodology	
2.1 Introduction	7
2.2 Report Design	7
2.3 Pre-Study	7
2.4 Data Collection and Source	7
2.5 Data Analysis	8
2.6 Interviewing	8
2.7 Sample Requirements	8
2.8 Ethics	8
Chapter III: Literature Review and Theory	
3.1 Literature Review	9
3.2 What is Digital	9
3.3 What is Supply Chain Management	9
3.4 What is Digital Supply Chain Management	9
3.5 Traditional Supply Chain Vs Digital Supply Chain	10
3.6 Forgoing the Digital Supply Chain	11
3.7 How Digital SC Technology Replaces Physical SC Process	12

3.8	Digital Technologies Involved in Smart Digital Supply Chain	14
3.9	Benefits of Digitally Transformed Supply Chain	15
3.10	Cognitive decision centers (CDs) in Digital Supply Chain	19
3.11	Future Proof of Digitally Transformed Supply Chain	20
3.12	Risk Assessment in Digital Supply Chain	21
Chapter IV: A Holistic Approach to Digital Transformation of Supply Chain		
4.1	Introduction	22
4.2	Digital Supply Chain Strategy	23
4.3	The evolution of the Digital Supply Chain	23
4.4	The Supply chain in the digital Enterprise	24
4.5	Digitally enabled SC ecosystem Vs Traditional linear SC	25
4.6	The logistics visibility framework	26
4.7	Enabling Digital Supply Chain Capabilities	27
4.8	Digitizing Procurement Function	27
4.9	Maturity Assessment for digital supply chain	28
4.10	Prescriptive supply chain analytics	29
Chapter V: Supply Chain Operating Model of Akij Cement Co. Ltd.		
5.1	Introduction	30
5.2	Process Analysis	31
5.3	Product Analysis	31
5.4	Competitive Analysis	32
5.5	Industry Analysis	32
5.6	Supply chain Strategy	33
5.7	Push-Pull Supply chain framework	34
5.8	SWOT Analysis	35
5.9	PESTLE Analysis	36
Chapter VI: Digital Supply Chain: Akij Cement Co. Ltd. Perspective		
6.1	Introduction	37
6.2	Technologies used in ACCL to enabling digital Supply Chain	37
6.2.1	Enterprise Resources Planning (ERP)	37
6.2.1A	Automated Purchase Requisition	38
6.2.1B	Automated Supplier Comparative Statement	40
6.2.1C	Digital Procurement Management	40
6.2.1D	Automated Material/Service Receiving	42
6.2.1E	Digital Inventory Management	43
6.2.1F	Digital Supplier Management	43
6.2.1G	Automated Invoicing System	44
6.2.2	Automated Notification System	45
6.2.3	Internet of Things (IoT)	45
6.2.4	Robotic Process Automation (RPA)	45
6.2.5	Cloud Computing	46
6.2.6	Artificial Intelligence (AI)	47
6.2.7	Mobile Applications (APPs)	48
6.2.8	Advanced Business Analytics and Smart Reporting	50
6.2.9	Big Data	52
6.2.3	Advance S&OP	52
6.3	How Digitization adding value to Akij Cement Co. Ltd.	53

Chapter VII: Conclusion

7.1	Introduction	54
7.2	Lessons Learned from the report	54
7.3	Learning Organizational Culture	54
7.4	Gather Knowledge	54
7.5	Improved Time Management	54
7.6	Improved Communication Skill	55
7.7	Lessons Learned from the University report	55
7.8	Main Findings	55
7.9	Future Recommendations	56
References		57
Appendix		59

List of Figures

Figure: 1	Management and Organizational hierarchy of ACCL	4
Figure: 2	ACCL SCM Function Organogram	4
Figure: 3	Level of Strategy	5
Figure: 4	Analysis Framework	8
Figure: 5	Evolution of Supply chain	10
Figure: 6	Supply Chain 4.0	10
Figure: 7	Traditional Vs Digital Supply Chain	10
Figure: 8	SCOR Model And digital Supply Chain	11
Figure: 9	Technology Used in Digital Supply Chain	12
Figure: 10	Digital Supply Chain Framework	13
Figure: 11	Performance and Digital Supply chain	13
Figure: 12	Technology for digital transformation	14
Figure: 13	Supply Chain Management Key Challenges in 2021	14
Figure: 14	Value Drivers for digitally transformed Supply Chain	16
Figure: 15	Digital supply chain innovation	17
Figure: 16	Significant improvements across multiple performance dimensions in DSC	18
Figure: 17	Customer behavior and maturity level	19
Figure: 18	Cognitive decision centers	19
Figure: 19	Future-proof of digitally transform supply chains	20
Figure: 20	Framework for Digital Transformation of Supply Chain Management	22
Figure: 21	Evolution of the digital supply chain	23
Figure: 22	The supply chain at the center of the digital enterprise	24
Figure: 23	The long road to Industry 4.0, the digitization of every aspect of business	24
Figure: 24	Digital supply ecosystems vs. linear supply chain	25
Figure: 25	Effect of push technologies and pull demand on the digital supply chain	26
Figure: 26	A single platform drives the logistics visibility framework	26
Figure: 27	Digital Supply Chain Capabilities	27
Figure: 28	Procurement 4.0	28
Figure: 29	Digital supply chain Structure	28
Figure: 30	Maturity Assessment for digital supply chain	29
Figure: 31	Supply Chain Prescriptive Analytics	29
Figure: 32	Akij Cement supply chain network	30
Figure: 33	The Most Recognized Model of SCM is SCOR Model	31
Figure: 34	Product line of Akij Cement Co. Ltd.	31
Figure: 35	Akij Cement Co. Ltd. Competitive Analysis	32
Figure: 36	Porter Five force Analysis	33
Figure: 37	Supply Chain Strategy as per Lapide	33
Figure: 38	Push-Pull SC Framework	34
Figure: 39	PESTLE Analysis	36

Figure: 40	ERP	37
Figure: 41	ERP Senior Management and All Middle Management Concerns	38
Figure: 42	Digital Supply Chain Management Process Flow in ERP	39
Figure: 43	Purchase Requisition Entry in ERP	39
Figure: 44	Purchase Requisition view in ERP	40
Figure: 45	Supplier Automated Comparative Statement in ERP	40
Figure: 46	Purchase Order Process Flow	41
Figure: 47	Auto generated Purchase Order sample in ERP	41
Figure: 48	Payment Process Flow in ERP	42
Figure: 49	Payment Register in ERP	42
Figure: 50	Automated Material receive in ERP	42
Figure: 51	Material receive UI in ERP	41
Figure: 52	Automated Inventory Reports in ERP	43
Figure: 53	Digital Supplier Management	44
Figure: 54	Contact List in Digital Portal	44
Figure: 55	Automated Invoicing System in ERP	44
Figure: 56	IoT process Flow	45
Figure: 57	RPA in SCM	46
Figure: 58	Cloud Computing in Digital Supply Chain Management	47
Figure: 59	AI Uses in Supply Chain digitization	47
Figure: 60	AKij Cement Automated Sales iAPPs Process Flow:	48
Figure: 61	Akij Cement iAPPs User Interface	49
Figure: 62	Demand Forecasting	50
Figure: 63	Forecast	50
Figure: 64	Procurement Analytics Dashboard	51
Figure: 65	Vehicle tracking system Dashboard	51
Figure: 66	Big Data in Digital Supply Chain	52
Figure: 67	S&OP UI	52
Figure: 68	Digitization add values to supply chain	53

List of Tables

TABLE 1	CHANGES IN SCM CONNECTION WITH TECHNOLOGY	11
TABLE 2	DIGITAL ARA IN SUPPLY CHAIN	12
TABLE 3	CHANGES IN SCM CONNECTION WITH TECHNOLOGY	15
TABLE 4	RISK ASSESSMENT FOR DIGITAL SUPPLY CHAIN	21
TABLE 5	PORTER FIVE FORCES (EMERGING MARKET VS DEV. COUNTRIES	32
TABLE 6	SWOT ANALYSIS	34

List of Acronyms

Abbreviation	Prolongation
ACCL	Akij Cement Company Limited.
DSC	Digital Supply Chain
ERP	Enterprise resource planning
CDC	Cognitive decision center.
BTS	Build to stock
IoT	Internet of things
AI	Artificial intelligence.
RPA	Robotic process automation.
SAS	Statistical Analysis System
RFID	Radio Frequency Identification
IR	Industrial Revolution
ML	Machine Learning
S&OP	Sales and Operation Planning

Glossary

Topic	Outline
ERP	Enterprise resource planning is the integrated management of key business processes mediated by software and technology, in many cases in real time.
CDC	Cognitive decision center. The supply chain covers products, suppliers, distributors and clients. It takes a cross-functional perspective. This allows organizations to perform advanced simulation and modeling to balance cost, revenue, and profit choices to identify the best compromise.
Procurement 4.0	Procurement 4.0 or Smart Procurement involves digitalization in procurement by integrating data across supply chains.
Industry 4.0	The 4 th Industrial Revolution is the continuous automation of existing manufacturing practices using modern intelligent technology. The M2M (Machine to Machine Communication) and IoT (Internet of Things) integrate wide-range systems for enhanced automation, enhanced communication and self-monitoring, smart machine production with a focus on production and supply chain management. Create an ecosystem more holistic and closer to your company.
SCOR Model	The SCOR (Supply Chain Operations Reference) model helps companies evaluate and complete supply chain management for reliability, consistency and efficiency.
Porter's Five Forces Model	Porter's Five Forces Framework is a way to analyze business competition. It derives five powers that determine the attractiveness of an industry in terms of the economics of an industrial organization in terms of competitiveness and profitability.
BTS	Build to stock is an approach to production which can build upon sales and/or historical demand plans. production planning is a forward approach.
Push Inventories	The push inventory classification includes forming or gathering inventory stock based on predictions of customer request and command.
PESTLE Analysis	A PESTLE analysis is an acronym for a tool used to identify the macro (external) forces facing an organization. The letters stand for Political, Economic, Social, Technological, Environmental and Legal.
SWOT Analysis	SWOT analysis is way of finding out the positive and negative sides of a company. It can bring a positive change for a company. It also can identify whether a particular company is viable or not and identifies the position of a company in the market place.

Topic	Outline
IoT	The Internet of Things refers to a network of physical objects ("things" or objects) embedded in the Internet in order to connect and share data with other devices and systems.
Big Data	Big data is the field that deals with how to analyze and systematically extract information or otherwise process data sets that are too large or complex to be processed by traditional data processing application software.
AI	Artificial intelligence (AI) is a machine programmed to think like a human and imitate behavior, and refers to simulating human intelligence. The term also applies to all machines that exhibit characteristics related to the human mind, such as learning and troubleshooting.
RPA	RPA (Robotic Process Automation) is a software technology that makes it easy to build, deploy, and manage software robots that emulate human behavior interacting with digital systems and software.
SAS	SAS is a suite of statistical software developed at the SAS Institute for data management, advanced analytics, multivariate analytics, business intelligence, criminal investigation and predictive analytics. SAS was developed at North Carolina State University from 1966 until 1976, when the SAS Institute was integrated.
Cloud Computing	Cloud computing is what allows users to directly use computer system resources, especially data storage and computing power, on demand without active management.
RFID	Radio frequency identification uses electromagnetic fields to automatically identify and track tags attached to objects. RFID systems consist of small wireless transponders, wireless receivers and transmitters.

Chapter I

Introduction:

1.1 Background

For every construction, cement is an essential element. Cement is produced in over 160 countries around the world. Cement is the most important component of concrete and is essential for the development of general infrastructure construction. The level of advances and benefits of modern automated supply chain management (SCM) in cement and concrete may promote or limit the world's economic development.

Today's supply chain is a series of individual sailed steps that go through marketing, product development, manufacturing, distribution, and finally into the hands of customers. Digital transformation breaks down these walls and chains are the supply of raw materials, components, spare parts and other commodities, fully transparent and fully integrated into all relevant actions, down to the transporter of the supply. Consider an efficient ecosystem. The finished product ultimately meets the needs of consumers.

The development of digitalized solutions and industry (IR) 4.0 have created a completely new business ecosystem for the organization. Additionally, customers are demanding more innovative, more diverse and environmentally friendly green products. This creates numerous challenges and constrain for all players in the supply chain system; yet, they also present an opportunity to create digital and automated solutions and practices that to improve performance and productivity.

To emphasize the benefits of building a digital twin of the traditional Physical Supply Chain using technologies like IoT, AI/ML, Blockchain, big data etc. that will enable the enterprises to unlock data and information from existing systems and thereby, strengthen and improve the visibility and efficiency of the Global Supply Chains to manage disruptions and expand local and global markets.

Digital supply chains are able to provide comprehensive information availability and superior collaboration that lead to improved reliability and efficiency of Internet of Things, as well as ERP software. Therefore, it is time for digital supply chain! Moreover, supply chain management is a key facilitator for new digital business models.

1.2 Objectives of the Study:

The purpose of this report is to investigate how a digitalized supply chain that connects the entire supply chain process can improve performance and add value to organizations. The report also aims to address the drivers of digitized supply chains that will lead to certain changes and added value. Its purpose is also to develop a conceptual framework for evaluating digital supply chains.

According to a recent study, digitized supply chains (DSC) can generate efficiency gains of 4.1% annually. DSC may also improve the top line and improve the margins. Digitalization can enable better or additional services, more compelling customer experience, etc. for close integration with customers. Digital supply chain use can increase annual sales by 2.9%.

This study aimed to review how the digital supply chain works, understand the digital supply chain in the cement industry, explain the evolution and advantages of digital supply chain management in the cement industry and demonstrate the current digital supply chain management practice in Akij concrete companies Ltd. The objective of the report was to provide a comprehensive overview of the digital supply chain.

1.3 Research Questions

A key question in this study is how digitization improves supply chain efficiency, agility, and customer focus.

Therefore, the following sub-questions are therefore intended to respond to the main question from the report:

1. When digitalizing supply chains, what are the main drivers?
2. How are these drivers modified?
3. What added value do these changes generate?

1.4 Delimitations and Limitations:

The study was delimited into the changes caused to digitization, giving a wider understanding of the meaning of the supply chain digitalization and the added value of the supply chain digitalization. The study was limited by the study of external companies that made data collection complicated by conducting an external case study. Initially, it was difficult to contact adequate staff who could provide adequate data. In addition, some people interviewed were skeptical about interviews since the study was initiated by an external company. However, this restriction was largely overcome by giving all companies and interviewees anonymity.

1.5 Background of the Organization:

Akij Cement Co. Ltd. (ACCL) is a well-known and well-established cement manufacturer company in Bangladesh. It is a sister concern of Akij Group of Companies. Akij cement is the only Fly Ash free cement in Bangladesh and it gives assurance of more than 100 years of durability to the building structure. The iron slag, composed instead of fly ash, offers long-lasting cement to build solid structures which have been built for over a century. In order to achieve the best quality, most machinery has been imported from a world-famous company. Akij Cement bags make the world bluer. Using the latest technology, Akij Cement emits 41% less carbon dioxide (CO₂), saving 20,000 megawatts of electricity.

An active and responsible attitude to the production of products is the main impulse to protect the rights of consumers. Therefore, (ACCL) Akij Cement Co. Ltd. is progressing slowly by delivering numerous messages to consumers: "Once people do what we are doing now."

Akij Cement Quick Facts:

- Established on 2002
- Total 1775 employees countrywide
- Latest VRM technology
- Production capacity 10780 MTs/Day
- Own Sack Plant (won woven bag factory)
- Fly Ash free
- 35 Lighters for carrying company's imported own Raw Materials
- Product distribution network and channels by Water & land way.
- Most modern quality assurance management system.
- Digital Supply Chain system

Figure-1: Management and Organizational hierarchy of ACCL:

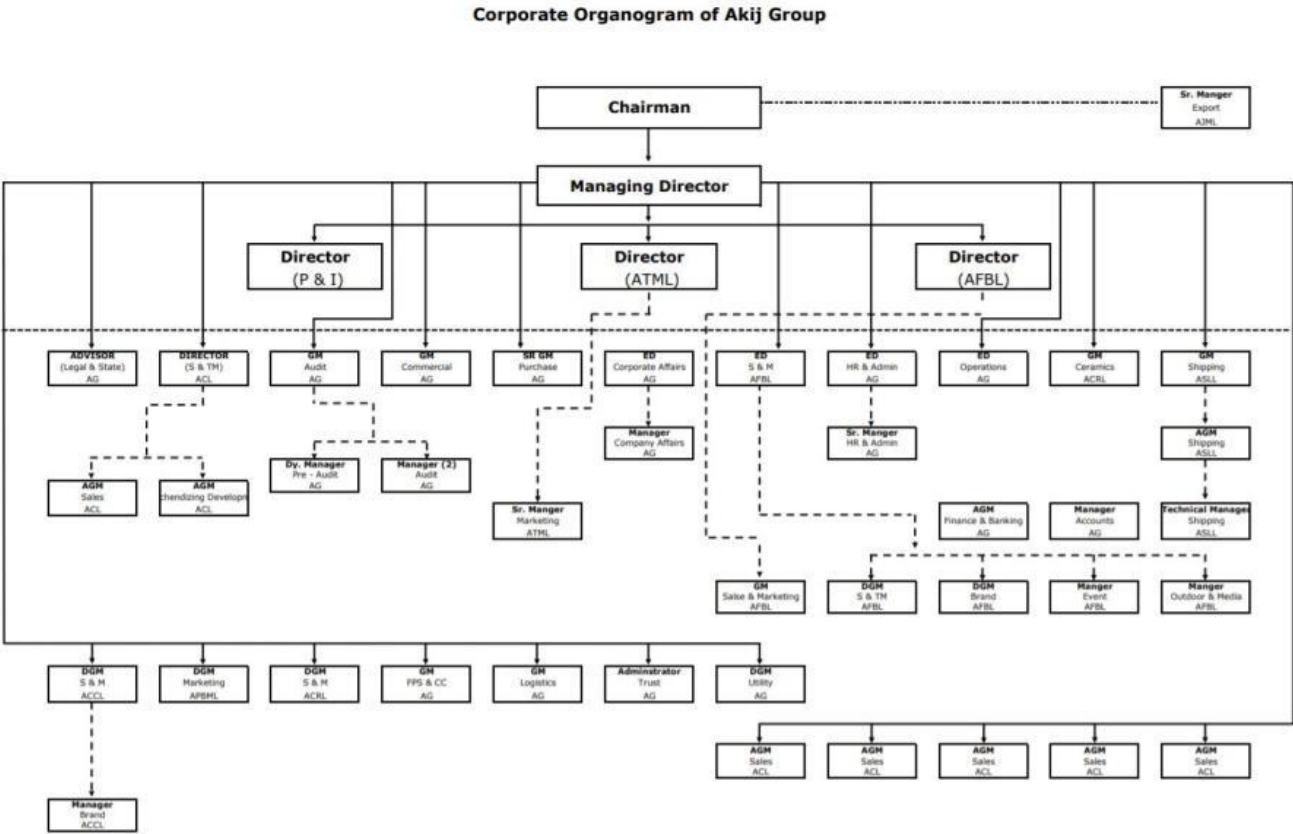
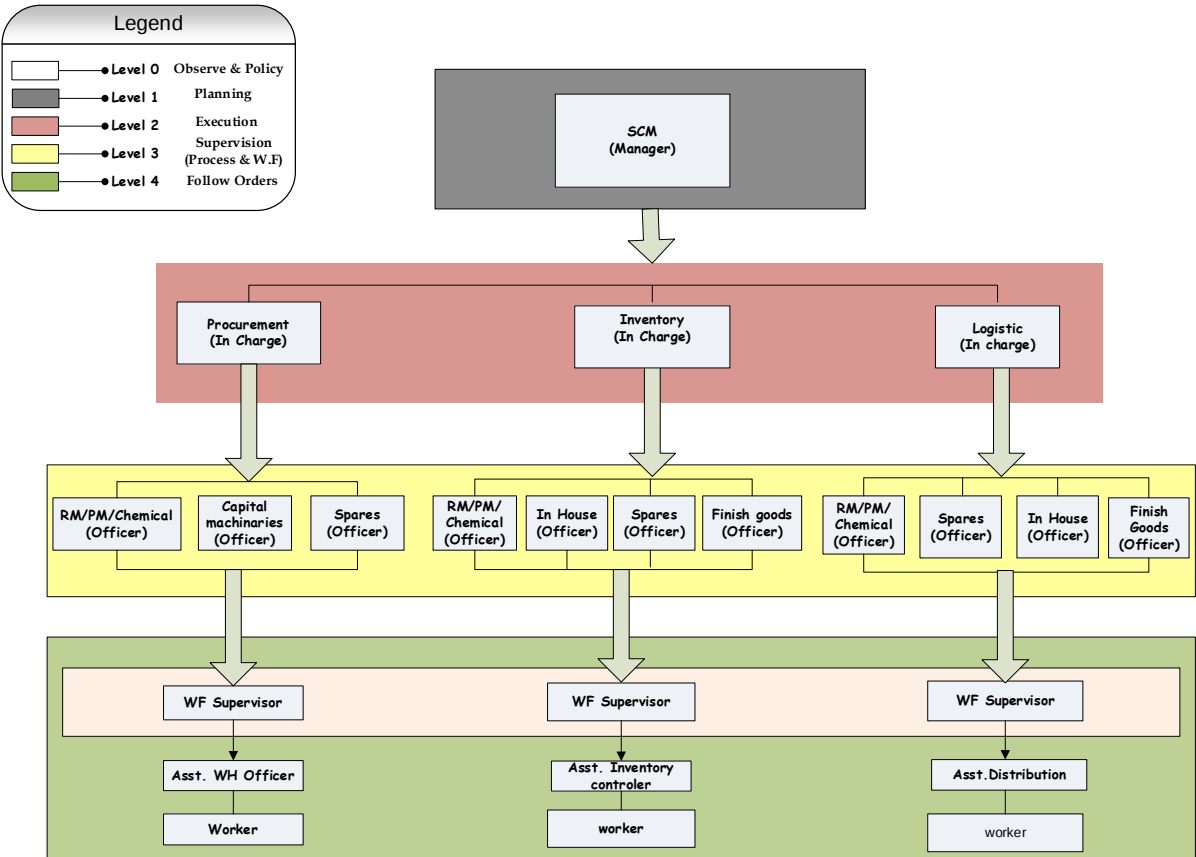


Figure-2
ACCL SCM Function Organogram:



1.6 Mission of ACCL:

The 'Mission' is the sense of purpose that describes how an organization achieves its vision. Mission of ACCL - We will strive to be a sustainable business.

"Ensure best quality product and service through continuous improvement that benefits society and environment."

1.7 Vision of ACCL:

"Be the benchmark of customer choice"

1.8 Values of ACCL:

- Customer centric
- Positivity
- Ownership
- Innovation
- Teamwork

1.9 Product/ Services of ACCL:

As we know Cement industry has limited SKU. Akij Cement currently have two SKU and it includes:

- Portland Composite Cement (PCC):** High-quality cement based on blast furnace iron slag that does not contain fly ash, especially strong and durable concrete even in harsh environments.
- Ordinary Portland Cement (OPC):** OPC is a common cement used in all common construction, i.e. bridge, buildings, and culverts etc. Especially used for concrete or brick, more than 95% high quality clinker and more than 60% calcium silicate (C3S) for early curing and increasing compressive strength. above the desired level.

1.10 Levels of Organizational Strategy:

The organizational strategy is usually a plan which specifies how the business assigns resources (e.g. money, work, machinery, method and stock) to support infrastructure, manufacturing, marketing, storage and other business activities.

Figure- 3 : Level of Strategy:



1.10.1 Corporate Strategies:

- Decisive what business the innovativeness should be into maximize profitability.
- Significant grand strategies.
- Defining the values of the get-up-and-go and how it is to be managed.
- Synchronizing and managing major resources and relationships between the readiness's its markets
- Entrants, associates and other environmental factors.
- Decisive on business locations and structures.

1.10.2 Business Levels Strategies:

- Managing and integrating unit strategies so that they agree with the corporate strategies.
- Developing the distinctive competencies and competitive advantages of each unit.
- Identifying the product niche market and developing strategies for competing in each.
- Monitoring products and markets so that the strategies confirm the needs of product markets at their current state of development.

1.10.3 Functional Strategies:

- Ensuring that the skills and competencies of functional specialists are utilized effectively.
- Integrating activities within the functional/operating area, such as purchasing, marketing.
- Providing information and expertise that can be utilized in the formulation of corporate.

Chapter II

Methodology

2.1 Introduction:

Methodology refers to the overall research or report strategy and principle. Research methods are defined in a systematic way that uses a variety of techniques to solve detection problems, interpret the information collected, and draw conclusions about research data. In essence, the research methodology is the Research or Report blueprint.

2.2 Report Design

In this report an iterative report approach was used. This means that the background, problematization, report questions, purpose and delimitations are revised and developed during the report. This is used since new knowledge is gained continuously during the report. The models and the finding of this report based on several secondary data and personal interviews. The organization executives, employees are the main source of information on this report.

2.3 Pre-Study

A pre-study was performed to get a holistic view of the problem. The preliminary study included unstructured interviews and meetings with key individuals and the Akij Cement Co. Ltd Process Owner. Initial meetings were held with the company supervisor and two other key employees. After the meeting, several unstructured interviews were held with the HO-SCM, an IT architect, and a person working with Akij Cement Company Ltd digital transformation team.

2.4 Data Collection & Source:

The literature reviews and interviews collected empirical data. In the report, mainly qualitative and in-depth interviews were conducted combining data found on the WEB-page of the company, the ERP software and documents received from the people interviewed. This report also included interviewing experts and businessmen with insights into the digitization of the supply chain of the respective company.

(A) Primary Sources:

1. Interview with ACCL corporate office Human Resource Department.
2. Presence the conferences, visiting factory.
3. Through observing and working with the real-life situation and scrutinizing various internal and external data the report is drawn up.

(B) Secondary Sources:

1. Annual report of Akij Cement Co. Ltd. (ACCL).
2. Printed outline and documentation supplied by Akij Cement Co. Ltd. (ACCL).
3. Website of Akij Cement Co. Ltd. (ACCL).

2.5 Data Analysis :

The analysis of the collected data was done together to develop and validate ideas as a series of interrelated and interacting processes. Analyzing data during and after collection helps shape the continuous direction of data collection.

2.6 Interviewing:

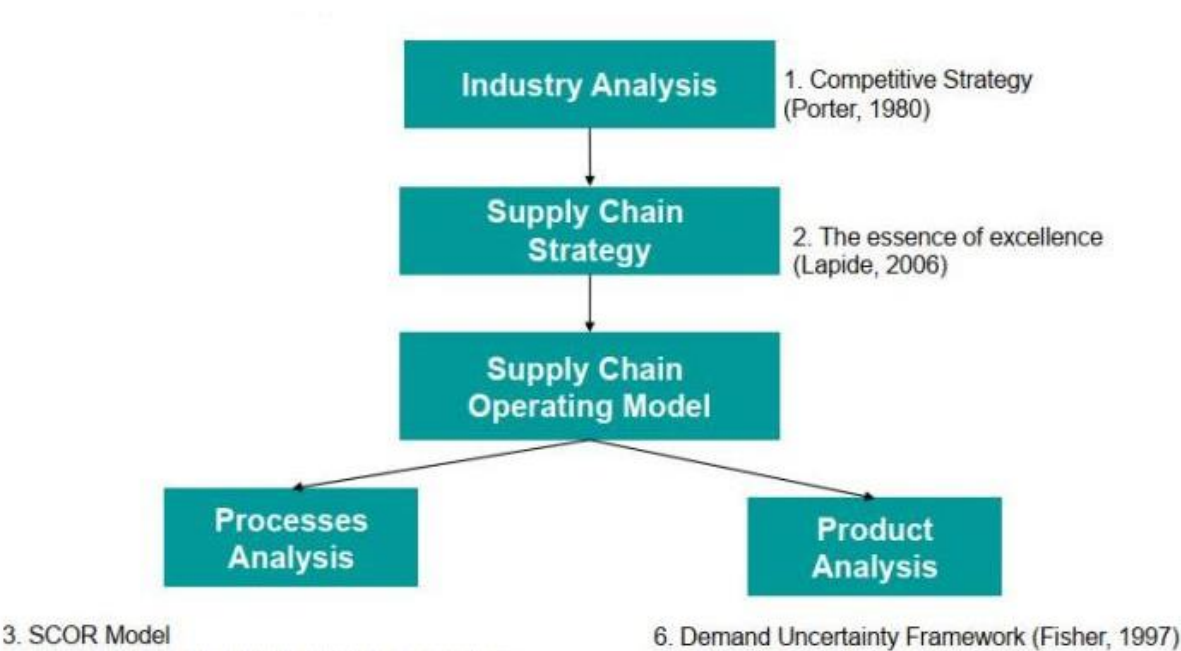
In total, 8 interviews were held, of which the majority was held face-to-face. However, because of full agendas two interviews could not be conducted face-to-face and were held via Skype. Furthermore, one of the interviews was held with two interviewees at once. Furthermore, if it was chosen to require transcription of all of the interviews, interview planning would have been more difficult. Besides that, note-taking did not significantly affect the interview results quickly because of the interview objectives. That is, statements did not have to be analyzed to the smallest detail to satisfy the interview objectives.

2.7 Sample Requirements:

several experts and practitioners from within Accenture were targeted to conduct the interviews and achieve the interview objectives. The interview candidates were preferably specialized in the resources industry, since this is the industry context of the report. Furthermore, from these potential candidates it was desirable to interview people who have expertise in supply chain management, the digital transformation (of supply chains), change management, and experts on the technologies involved.

Figure-2.1 shows the three levels of analysis and the framework I used. These are described in each section of this report.

Figure- 4 Analysis Framework



3.1 Literature Review:

Literature reviews, conducted continuously throughout the study. First, by examining the phenomena of digitization and digital transformation in supply chain theory, the full picture of the scope was identified.

Literature reviews were conducted using a variety of sources of research, including articles from highly influential scientific journals and minutes of indexed conferences. The query procedure was created by first referencing the relevant information source. The main sources of literature search and review were the internal database and search engine provided by Akij Cement Co. Ltd. and Google Scholar.

3.2 What Is Digital?

Generally Digital means automation and technology and it refers to technological trends and this includes:

- » Physical “things” incorporating computer technology (sometimes referred to as the Internet of Things)
- » External big data, including social, news, events and weather, readily available
- » Increases in real-time and intelligent computer programs, software etc.

3.3 What is Supply Chain Management?

In general, supply chain management is mainly concerned with the efficient and effective integration of suppliers, factories, warehouses, stores, ensuring that goods are produced and distributed in the right amount, in the right place, at the right time, and with minimal total. System costs are subject to meeting service requirements.

3.4 What is Digital Supply Chain Management?

Today's supply chain is a series of mostly inconspicuous, sailed steps that customers can take from the hands of marketing, product development, production, and distribution. Digital transformation breaks through those walls, and the chain becomes a fully integrated new ecosystem that is totally transparent to all actors – from raw materials suppliers, materials and spare parts, to the carriers and finished products suppliers and, finally, to the demanding customer satisfaction.

This integrated network relies on several key technologies: integrated planning and execution systems, logistics visibility, autonomous logistics systems, smart procurement processes and digital inventory and spare parts management, and advanced analytics. As a result, businesses can fully model their networks, create “what-if” scenarios, and respond to supply chain disruptions and anticipate them by adapting their supply chains in real-time as circumstances change. A digital transformation of supply chain capitalizes on these three trends to profitably plan and deliver customized, individualized products and services. Digital and modern technology drives business process and time convergence across demand and supply processes from high-level planning to the execution, resulting in real-time systems and processes. Basically, it rules everything around the supply chain process at this point.

The two biggest benefits that can be obtained through the digital conversion of supply chain processes are increased speed and reduced costs. Raising operations to the next level of technology can significantly reduce the time it takes to make strategic decisions while improving operational efficiency and effectiveness. By improving prices and operating costs, product producers believe that sales will increase through more digital processing. End-to-end transparency is the ultimate goal of multiple supply chain operators and is a key component in achieving significant efficiency gains. A system with end-to-end transparency and efficiency that allows all members of all stages of the supply chain network and channels to access all data. It provides full real-time insight into the entire supply chain, enabling greater digital process visibility and accountability and giving people complete control along the chain.

Figure: 5 Evolution of Supply chain

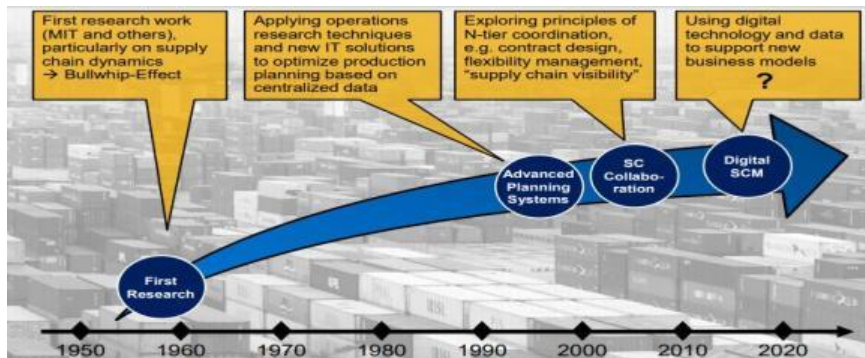
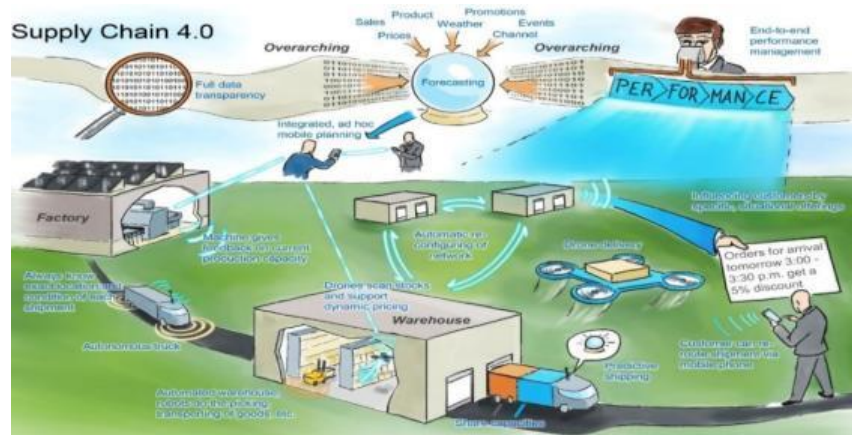


Figure-6 Supply Chain 4.0



During the COVID-19 pandemic, incalculable Supply Chains have been disabled throughout the planet because of their obsolete frameworks. Detectability can self-destruct when certain parts of the organization need to close because of unanticipated reasons. Numerous cycles that spin around conveyances run with an eye to eye, paper-based mark. While social removing measures are set up, this can be troublesome - if certainly feasible - to complete, making further interruptions Supply Chains. Utilizing a computerized way to deal with these commonplace frameworks can take out the requirement for vis-a-vis associations, improvement of business during and after the pandemic COVID-19.

3.5 Traditional Vs. Digital Supply Chain:

The conventional production network measure is really clear. However, there are a few contrasts in the store network measure for computerized items rather than conventional items. The computerized production network is the place where the focal control center directs the entire production network utilizing innovative empowering agents like an organization of sensors and social advances.

Figure-7 Traditional Vs Digital Supply Chain



Table-1 SCM changes related to digital technology:

Area	Changes	Technologies
SCM integration	Two-way information sharing, more integrated, faster to capture data, more useful data	Robotics process automation (RPA)
SCM reconfiguration	Changing people's working role Possible flexibility regarding working location Simplify SCM	Mobile, mega-tech trends
Process Automation	Replacing physical handling task, manually handling task which has a repetitive characteristic, leading to works automated.	Robotics process automation, Robotics arm
Analytics	Real-time data, historical data, more available data and more accurate demand planning.	Robotics process automation, AI

3.6 Forging the Digital Supply Chains

An increasing number of digital supply chains use device-based intelligence, external big data sources and intelligent supply chain software for several purposes:

- » Improve customer experiences
- » Deliver higher profit
- » Increase the value of products in the market
- » Create new business models and revenue streams
- » Rule the world (okay, maybe not this one)

In the digital supply chain, supply chain management software consumes digital signals in real-time, allowing the software to convey an accurate, precise understanding of everything happening in the supply chain. Tush, the physical world of supply chain assets and the digital world of supply chain software converge into one profitable, customer-focused system. Everybody happy?

Figure-8: SCOR Model And digital Supply Chain

Technology		Plan	Make	Source	Deliver	Return
Enabling effortless decision making	Cyber security	✓	✓	✓	✓	✓
	Data analytics	✓	✓	✓	✓	✓
	IOT	✓	✓		✓	
	Serialization	✓	✓		✓	✓
Enabling frictionless processes	Additive manufacturing		✓			
	Blockchain		✓	✓	✓	✓
	Intelligent automation	✓	✓	✓	✓	
	Mobility	✓	✓	✓	✓	✓
	Robotics		✓		✓	

3.7 How Digital Supply Chain Technology Replaces Physical Supply Chain Processes:

A Digital Supply Chain (DSC) is a smart, value-driven, efficient process to generate new forms of revenue and business value for organizations and leverage new approaches with novel technological and analytical methods. DSC is not about whether goods and services are digital or physical; it is about how supply chain processes are managed with a wide variety of innovative technologies, e.g. unmanned aerial vehicles, cloud computing, and Internet of Things, among others.

Figure-9: Technology Used in Digital Supply Chain

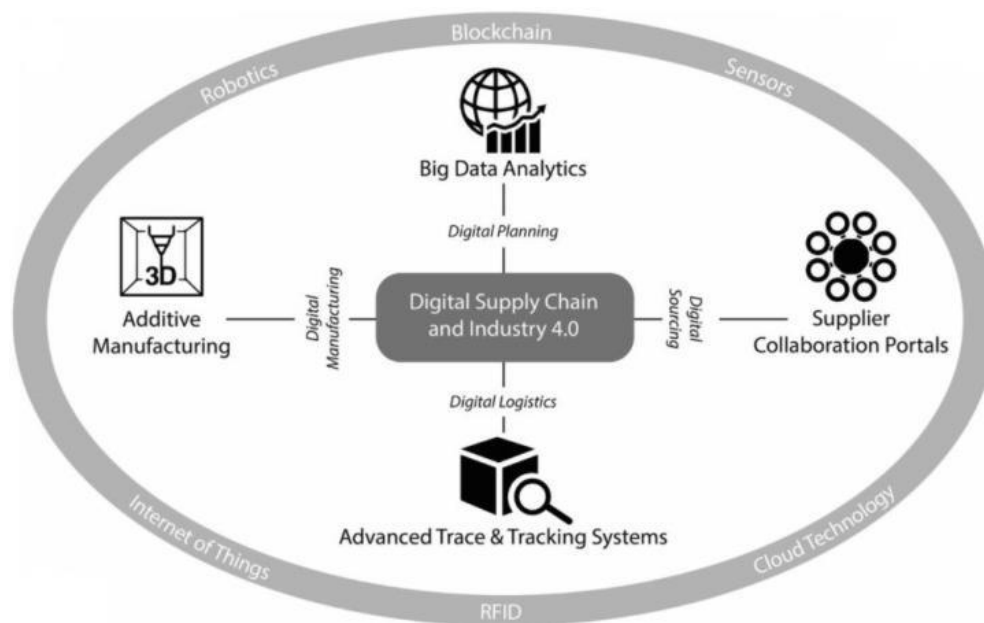
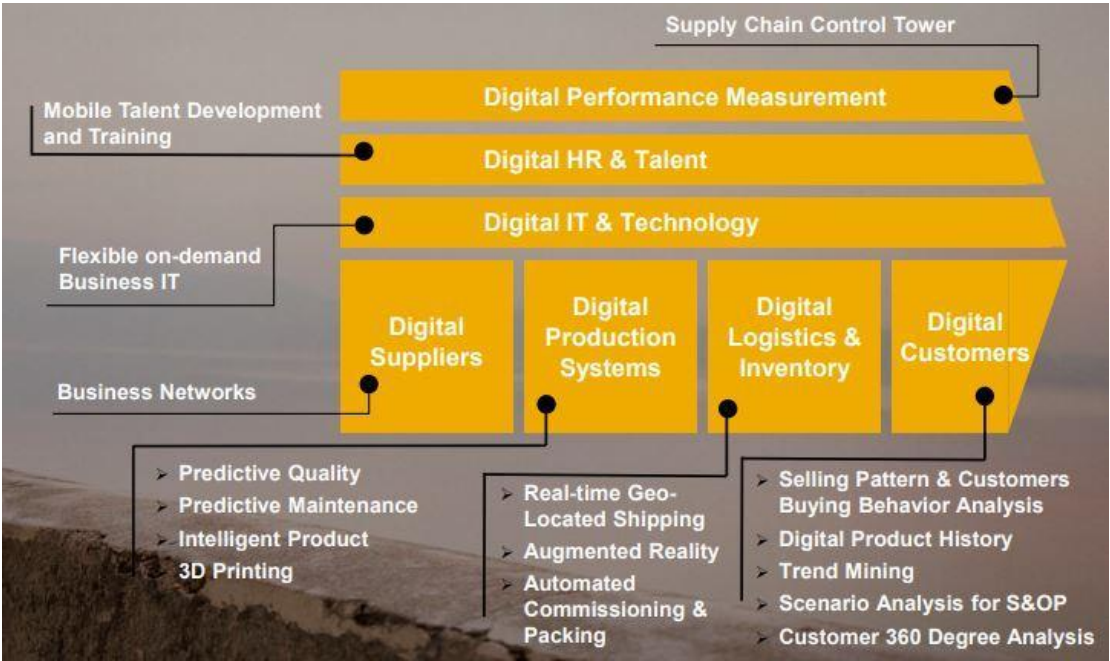


Table-2: Digital Area in Supply chain

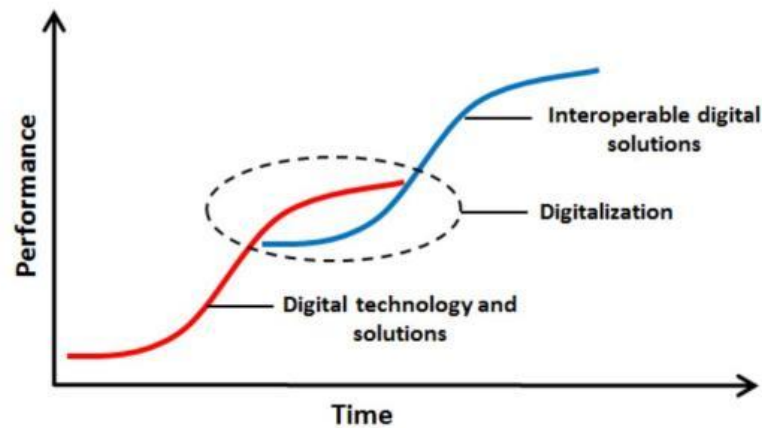
Digital Area	Description / Example
Enabling interactions with consumers	Discovery, report, buying, rating, and returns through e-commerce and mobile.
Driving business-to-business (B2B) interactions	These interactions become increasingly digital through machine-to-machine interactions.
Driving personalized fulfilment	The digital supply chain finds a path to deliver what the consumer wants, when and where it wants it.
Enabling real-time systems and physical-digital convergence	The digital supply chain processes digital signals and big data to create an accurate picture of the supply chain and consumers.
Enabling learning systems	Supply chain software employs artificial intelligence to learn and adapt, rather than just handle a prescribed set of inputs with a prescribed set of actions.
Assisting physical assets – machinery, property, plant, equipment	Computer technology is embedded in production capacity and transportation equipment, providing status and location information.

Figure : 10 Digital Supply Chain Framework



Behind the great potential of the digital supply chain (DSC) is Industry 4.0. Production and automation transformations were first brought about by steam and hydropower (Industry 1.0), electronics, and more recently digital computers. Industry 4.0 digitization is about businesses that reach out to customers through e-commerce, digital marketing, social media and customer experiences. With final reports and vertical integration of development, manufacturing, marketing and sales, and other company operations, and the new business models that come with these developments, almost every aspect of the business is changing. In fact, we tend to territorialize devices that evolve towards the digital way as a whole. The plan supports the full implementation of various digital technologies such as cloud, big data, things web, 3D printing, and real growth. Together they enable the digitization of new business models, products and services, and the digitization and integration of each link in the right company's price chain: digital geographic points, development, innovation, engineering, production, distribution, Digital sales channels and customer relationship management.

Figure : 11 Performance and Digital Supply chain

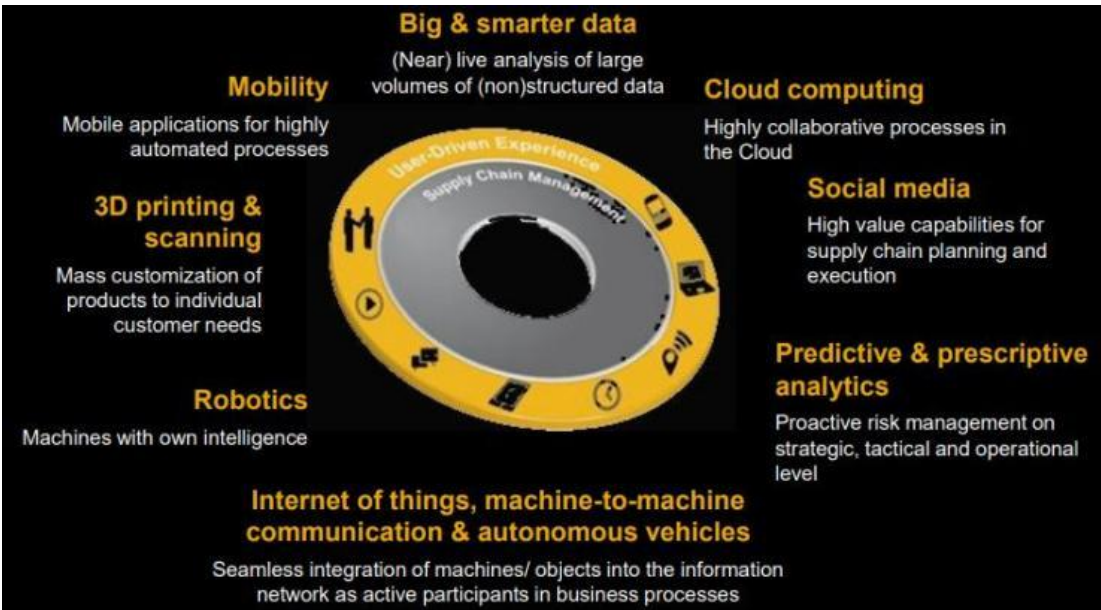


The digital supply chain lies at the heart of the whole industry and is central to each company's activities in which something is produced or distributed. The supply chain is in fact that of the company for several companies. It extends the consolidation of all corporate functions to the horizontal dimension, through a net of sensors and social technologies, supervision through a central management hub, and management via overall management, knitting together the relevant players—the raw materials and element providers, the production process itself, the warehouses and distributors of the finished product and finally the client.

3.8 Digital technologies Involved in Smart Digital Supply Chain:

Various technologies could be grouped into three broad fields: data analytics and visualization technology; operational automation technologies and equipment management; communications technologies among supply chain participants.

Figure:12 Technology for digital transformation



High-quality up-to-date data is being gathered, analyzed, integrated and interpreted by digital technologies. These data are used for the development of automation, forecasts and robotic innovations, which replace traditional management of the supply chain.

Figure:13 Supply Chain Management Key Challenges in 2021

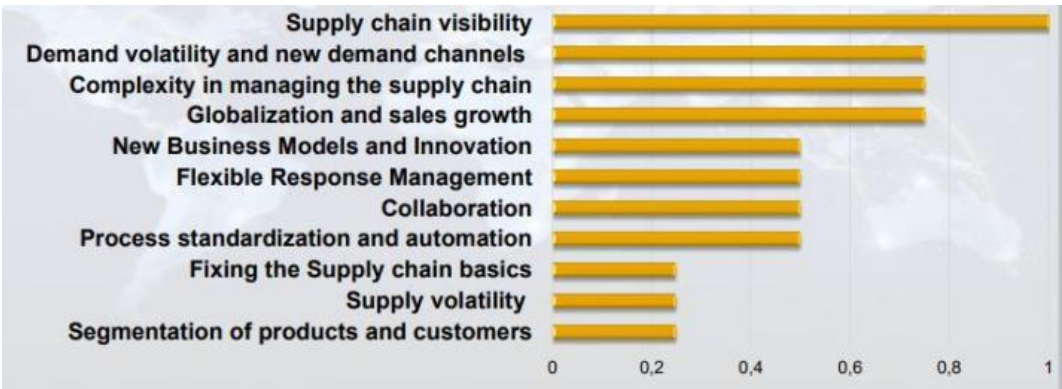


Table:3 Changes in SCM in connection with digital technology:

Goal	Functions	Information and automation systems and technologies	Digital technologies
Data analysis and visualization	Navigation of business processes, electronic catalogues data unification, integration of information systems, monitoring supply chain, real time planning of enterprise activity, administration of product data and events, data processing, predictive analytics	SCOR, ISO,CALS standards, ERP, PIM, SCEM, TMS, SCMo, Real-time Factory Scheduling	Big Data, artificial intelligence, cloud computing and storage, quantum computing, S&OP platforms, smart warehouse, wearables
Communication between supply chain participants	Automated supplier search, electronic procurement, e-commerce, supply chain processes synchronization, supply chain transparency, communication between supply chain elements	CRM, SRM,CSR,AMS, Single Window ,EDI, EANC OM,EDIFACT, digital signature	Automated e sourcing, omni-channel Smart Fulfillment Solution, blockchain,social media marketing,feedback loop, social networks
Automation of processes and asset management	Flexible automation of production, digital production processes, digital product quality, digital reverse engineering, virtual analogues for physical products/product ion	Robots, automatic production lines, WMS, Flexible Factory automation, RFID	Digital twins, 3D-seal, sensors, driverless vehicles mixed and augmented reality, industrial IoT, additive manufacturing, intelligent robots

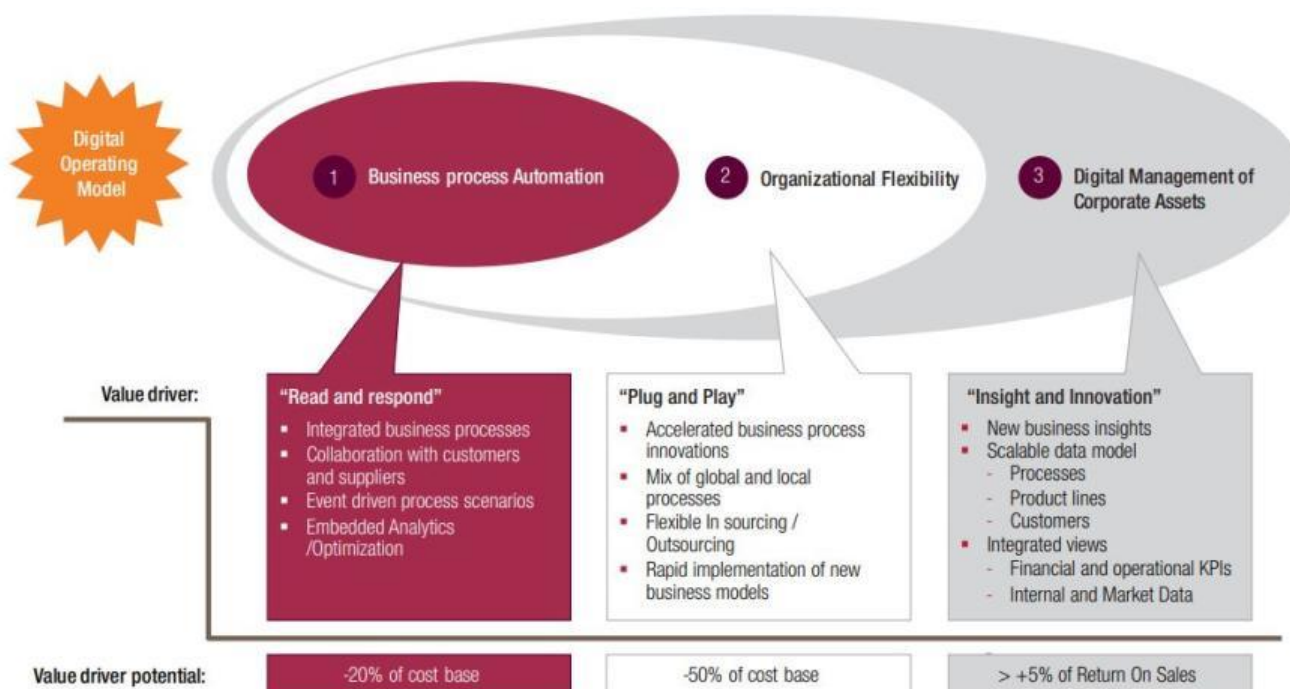
3.9 Benefits of Digitally Transformed Supply Chain:

Superior collaboration and integration can lead to greater reliability, agility and effectiveness of digitally transformed supply chain systems for the extensive availability of data and information.

At the core of digitally transformed supply chains lies the general availability of information. They work and communicate actively across digital platforms through the appropriate company structure and management, leading to improved accountability, leggedness and efficiency. This distinguishing performance can force organizations with old supply chains to adapt to new digital realities or take the chance to compete.

The digital operating model is about implementing digital and new technology capabilities alongside governance, processes, data, compliance and performance management, and the IT company hierarchy. Enables the required level of integration, collaboration, and process standardization. The advantages of the digital operating model can be broadly divided into three categories. Process automation and concentration helps organizations make their human resources more efficient. Visibility allows companies to manage their own assets and contract assets and other resources in a more cost-effective manner to optimize their customers and product portfolios. From previous experience, automation of processes typically leads to cost savings of up to 25% on a related cost basis, and centralization, including outsourcing, helps in cost savings of up to 46%. In addition, digital management of corporate assets allows organizations to increase their EBIT margins by more than 8% and in some cases even further.

Figure : 14 Value Drivers for digitally transformed Supply Chain



The digital supply chain management has the following advantages:

Advanced track and trace:

This allows organizations to track raw materials and finished products from country of origin to point of sale, ensuring good visibility and control for the supply chain. Advanced tracking and tracking solutions enable real-time tracking and instant location analysis of assets and inventory.

Tracking technology allows independent verification and control measurements of time and place when changes in scheduled freight routes or climate control are detected. This will allow rationalization and optimization of the fleet, which will increase the profits of the top line.

Predictive analytics:

A major cause of performance degradation is the fact that supply chain risk mitigation strategies are based on historical data and scale. New predictive modelling could help support informed decision-making and enable action, not reaction. If delivery is not done fully or on time, it is too late for customers to be already disappointed. In fact, if this doesn't solve the problem, we apply resources and time to recover from the outage. Many key supply chain managers are using data analytics, machine learning (ML) and other technologies to predict the potential for disruption in their supply chain, including pandemic, financial, geopolitical and environmental events. It can support organizations with challenges related to operational planning, inventory management, production planning and proactive risk management.

Scenario planning allows organizations to look at larger images and make effective compromise decisions on issues such as: How to balance the location and cost of holding inventory with the cost of not being able to satisfy customers. By performing quick simulations, real-time stocks can identify sweet spots between clearly conflicting objectives based on customer demand and provider capabilities. Such scenarios, which are becoming more and more active in AI and automation, can be useful in prescribing rather than just predicting. By analyzing past incidents and anticipating future threats, companies are at risk and can identify strategically concentrated supplies, most importantly lacking current internal risk capabilities. It means that you can recognize the time when it was proved to be.

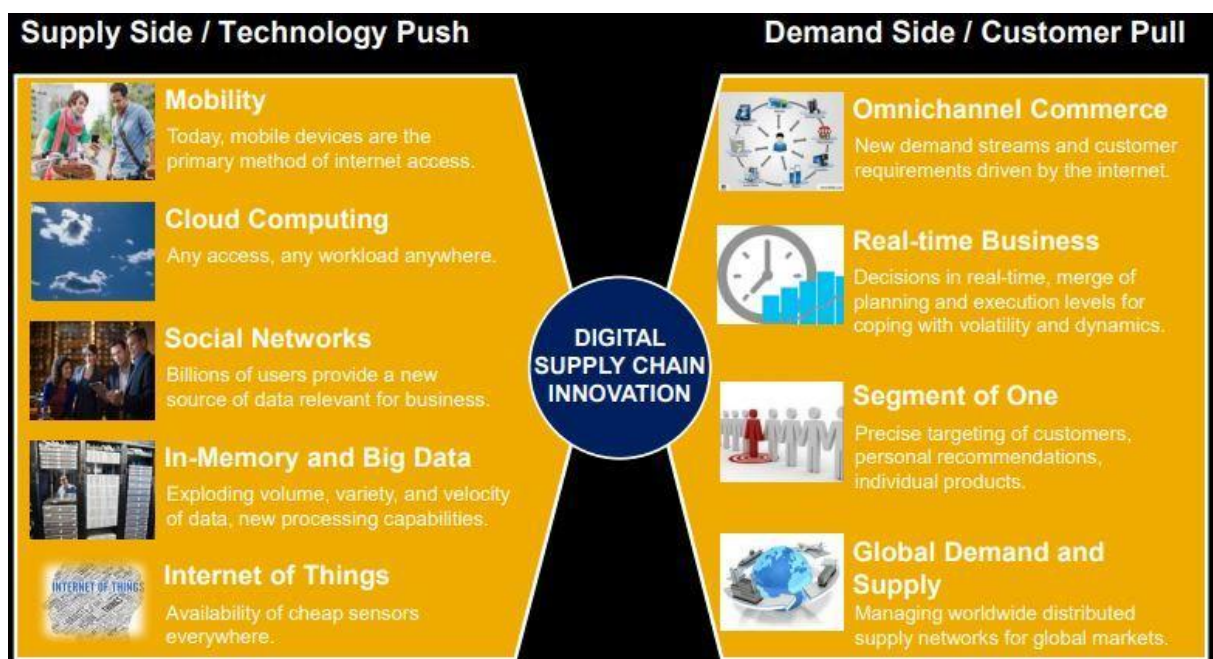
Better decision making. Machine learning systems can provide supply chain managers with recommendations on how to handle specific situations, such as material planning and scheduling changes in response to new customer orders.

Automation. Automated operations streamline the work of supply chain professionals, freeing them to focus on more valuable tasks. For example, since digital solutions can be configured to automatically process real-time information (e.g. automated S&OP preparation and workflow management), manual data collection, scrubbing, and input are required.

End-to-end customer engagement. Digital technologies can improve the customer experience by giving supply chain managers a lot of control and providing customers with unprecedented transparency. For example, a tracking system that sends detailed updates about your order through lead time.

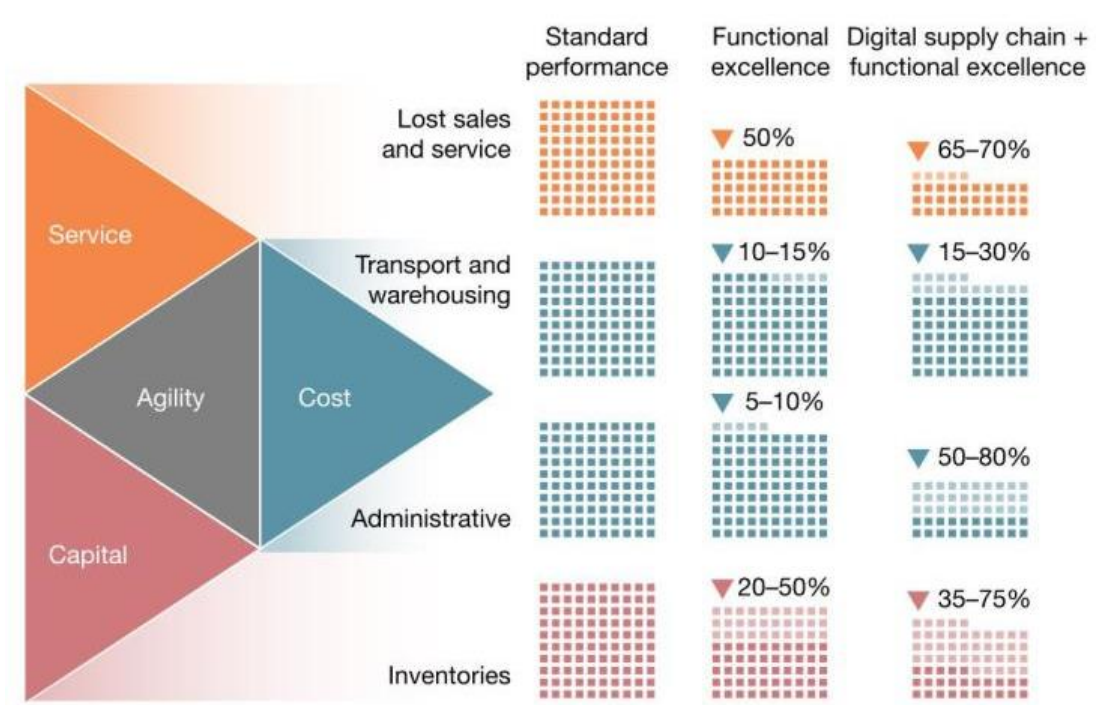
Innovation. A Digital Supply Chain can help a company to strengthen its business model (e.g. through expansion into new markets) and work more efficiently with both customers and suppliers (for instance, by using data from the ERP systems automatically from S&OP decisions).

Figure:15 Digital supply chain innovation



Talent. Digital supply chains have significantly different workforce requirements than traditional supply chains. At least a few supply chain managers should be able to translate business needs into relevant digital and automated applications. Performance objectives complete the organization's vision for an innovative supply chain system. Setting performance goals requires businesses to measure current performance and determine achievable improvements. Goals can be defined in terms of measures of agility, services, capital, and cost. For example, if a company aimed at reducing losing revenue by just a certain amount, its supply chain needs performance targets. For example, you need to improve the speed and reliability of delivery to your customers.

Figure:16 Significant improvements across multiple performance dimensions in DSC



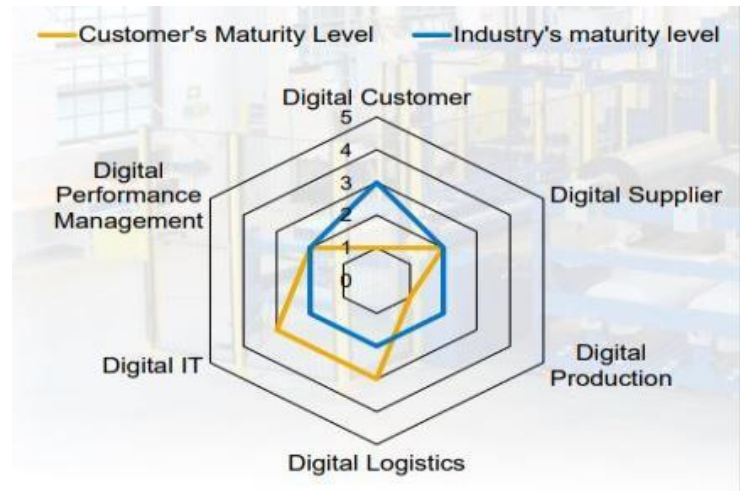
Improve Shipping Efficiency:

Artificial intelligence can quickly analyze and provide solutions to the complex distribution challenges faced by supply chains. With the help of AI, businesses can automatically respond to specific triggers within their supply chain. Rather than waiting for people to see and review, artificial intelligence can immediately identify opportunities for transportation improvements that can improve efficiency, reduce costs and increase customer satisfaction. So not only will the overall cost be reduced, but satisfied customers will be able to earn money to reopen their business again.

Identify Patterns and Plan for Predicted Customer Behavior:

Using images and historical data, the artificial intelligence platform was able to quickly analyze images and learn giraffe identification patterns to make them specific. When businesses become aware of these patterns, decision-makers can anticipate and plan accordingly rather than raising staff levels, increasing production, or more efficiently defining specific customer relationships and responding to them.

Figure- 17 Customer behavior and maturity level



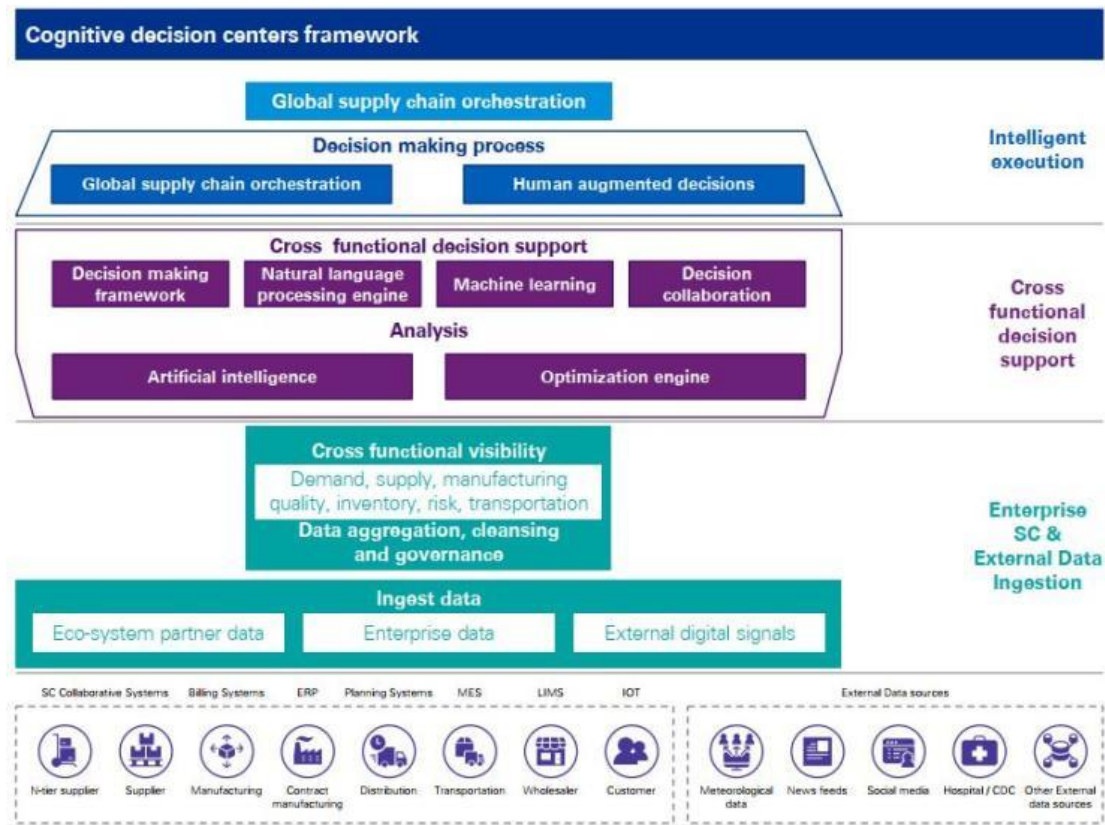
Building More Efficient Supply Chains:

AI Direct gives businesses the ability to leverage artificial intelligence to improve their work. In addition to reducing supply chain costs, there are numerous other benefits to introducing AI into supply chain management. To learn more about how artificial intelligence is improving global supply chains, contact directly today.

3.10 Cognitive decision centers (CDCs) and Digital Supply Chain:

Investing in the CDC provides a cross-functional perspective on the supply chain, from sales on one end to finance and procurement on the other end. In general, each of these features is autonomous, unrelated to the organization's broader strategic ambitions, and incentives for targets defined in its own terminology. In addition, they have nearly inconsistent priorities. Each feature strives to optimize for its key performance indicators, which inevitably has a negative impact on the performance of other features.

Figure 18 Cognitive decision centers:

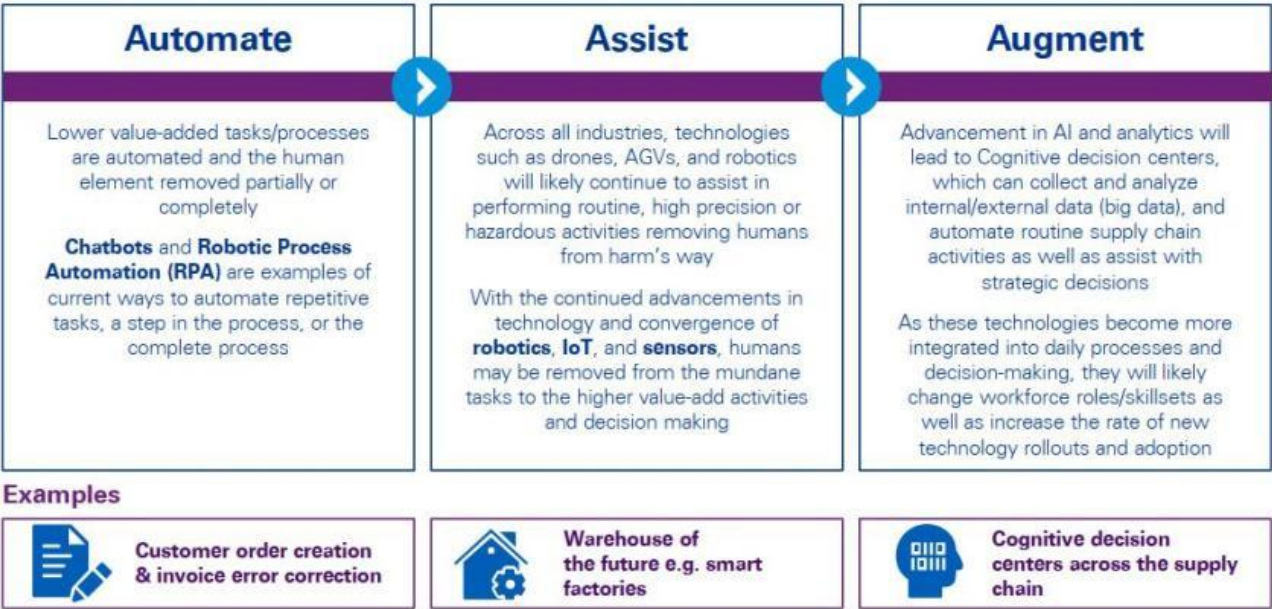


Future CDCs will use state-of-the-art artificial intelligence to capture and analyze cross-functional data to help decision-makers across the organization recognize collision points and find optimal scenarios. Can be simulated. Simply put, the CDC optimizes company-wide results, not individual business results, including:

1. Greater transparency to improved decision-making.
2. Reduced stock levels due to the use of more just-in-time procurement.
3. Clear view of stock levels throughout the entire value chain due to the fully integrated system.
4. More decentralized storage to reduce delivery times.
5. Reduce delivery times as the number of phases in the sale chain will be reduced.
6. Better customer requirements understanding through sensing demand and up-to-date data.
7. Strong customer bonds, higher sales, high profit margins.
8. Enhanced flexibility of the supply chain and reduced supply chain risks and costs.
9. More alternatives to better supply chain management decisions will be available in the process of decision making.
10. Sustainability of competitive advantage.

Good supply chain management is the combination of two things: 1) it can reduce complexity and 2) it can reduce uncertainty. The implementation of new technologies enables the coexistence of digital drivers and humans across various supply chain processes and activities, helping to achieve two goals:

Figure: 19 Future-proof of digitally transform supply chains



For this reason, there are several approaches and technical solutions that can be used to provide accurate visibility into the supply chain. This enables enterprises to make critical real-time decisions and respond to how to monitor and adapt to future changes in customer behavior and supply chain fluctuations.

3.12 Risk Assessment in Digital Supply Chains

However, the digital supply chain generated by digital transformation has created some new risks in the supply chain. Digital supply chains look for the benefits of pass duration and prevent losses in the digital supply chain (DSC). Risk management must be important in DSC to prevent loss in DSC.

Table-4 Changes in SCM in connection with digital technology:

Category of Risk	Definition	Drivers of Risk
Supplier operational	These risks are undesirable cases that may prejudice supplier throughput in the way of quality, quantity and cost.	Quality challenges, unforeseeable quantity and cost, significant alteration in lead time, supplier retardation, material availability, improper technology.
Cultural	These risks are cultural risk factors that can lead to disruptions in the supply chain.	Language differences, finite knowledge about cultural differences.
Demand	Potential dissimilarity between forecasted demand and actual demand.	Prediction errors, low level of supply chain association, low level of information sharing, long-term horizons, demand instability and shortage rumors.
Transportation	These risks are undesirable cases that may bring about delay in the consignment of raw materials or finished goods.	Port strikes, malfunctions during distribution and transportation, unreachable information about shipping.
Inventory	These risks are those created by storage activities that may adversely affect the supply chain.	High level of inventory cost, value of goods, excessive amount of inventory, rate of obsolescence of goods.
Legal, bureaucratic and regulatory	Legal, bureaucratic and regulatory	Lawsuits filed by supply chain stakeholders such as suppliers and customers.
Consumer risk	A focus firm's failure to meet customer priorities.	Difficulties in order fulfilment, changes in customer preferences, delayed delivery, inappropriate quality
Technology and Cybersecurity	The risks that the technology used and the system created may pose.	Cyber-attack, spyware virus, unauthorized access, data theft, risk of loss of reputation due to technology, privacy violations, sharing information in inappropriate ways
System risks	The risks related to the systems that supply chain members use for their activities.	Faults in information technology systems, information infrastructure not working, system mergers or extended system networks, e-commerce

Chapter IV

A Holistic Approach to Digital Transformation of the Supply Chain

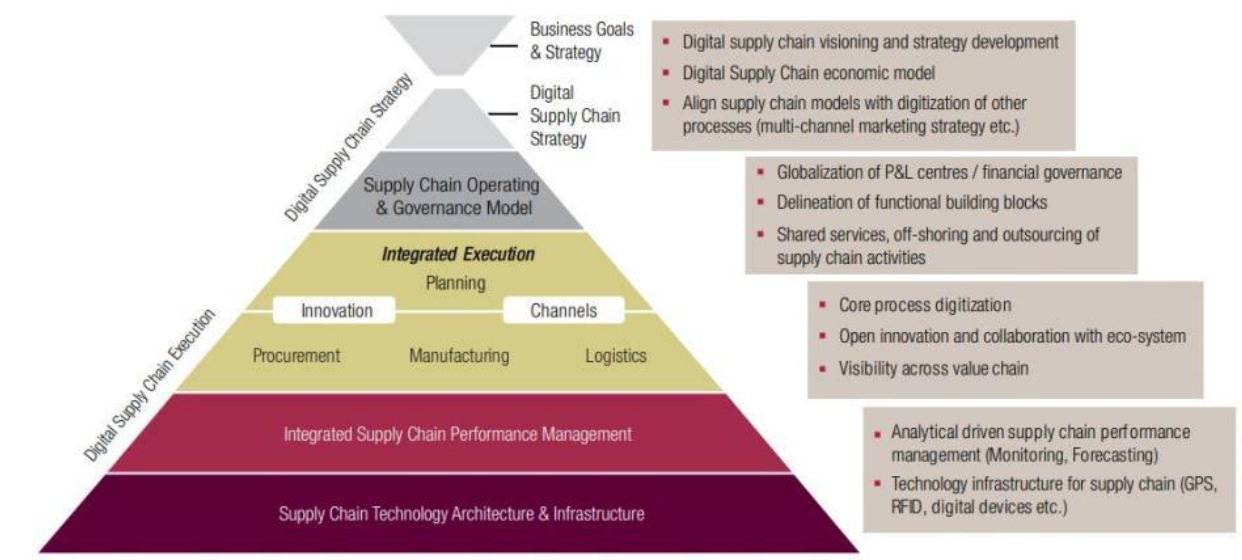
4.1 Introduction:

A holistic approach to the digital transformation of the supply chain can set the direction for integrated implementation, starting with a digital strategy and a digital in operation model. This cannot alter organizations solely to understand, however, the untapped potential of existing skills together to achieve higher performance and ultimately generate greater value.

One of the most common challenges faced in the digital transformation process is the temptation to implement digital initiatives in silos or through a technology-driven approach. When organizations implement digital initiatives that are cut between functions, disputes over resources typically arise that lead to inefficiencies and conflicts between the sectors. This puts the company in danger of being seen as a natural phenomenon rather than a program of change. In our view, digital transformation is not about technology, but about business transformation of the entire enterprise.

It is important that digital supply chain strategy is part of an organization's general business model and structure as a nurse training associate professor. Transforming an entire organization's digital operating model clearly has high potential, but also carries the highest complexity and risk. I believe there are five dimensions to take into consideration, regardless of the scope of the transformation.

Figure:20 Framework for Digital Transformation of Supply Chain Management



4.2 Digital Supply Chain Strategy

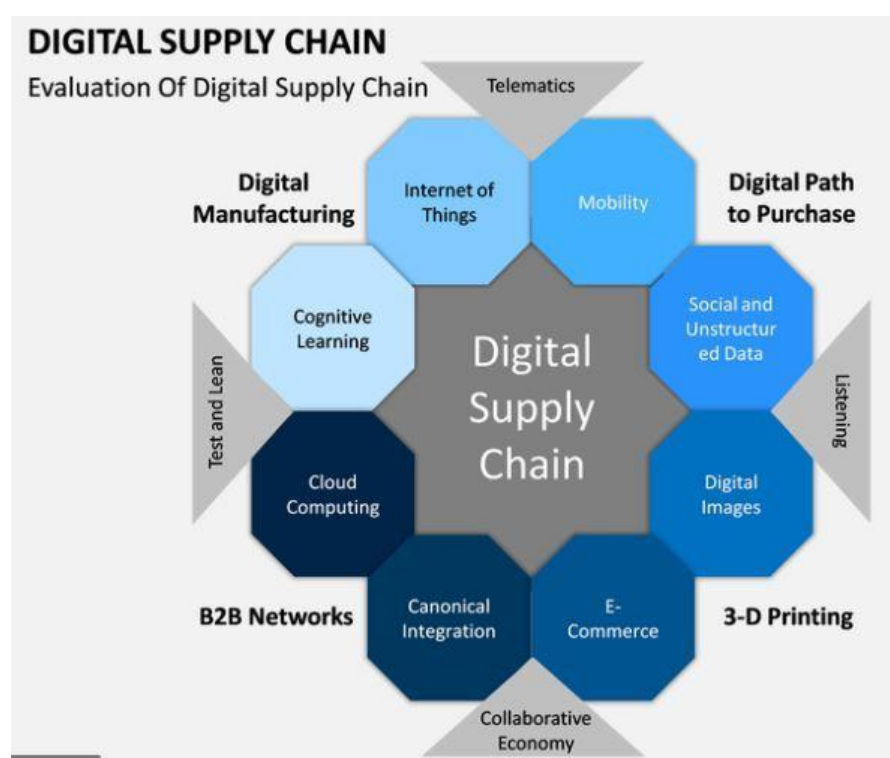
Digital initiatives in the global supply chain strategy must be integrated by a company to generate and measure long-term value. The value generation potential within the existing supply chain can be emphasized in the intensive analysis phase. Identifying business benefits requires a superior management experience and expertise and input with regard to pain and best practices currently perceived.

Integrating digital initiatives into supply chain strategies is essential for businesses to realize long-term value. Focused analysis can highlight the potential for value creation in existing supply chains. Identifying business benefits requires management experience and input on currently recognized challenges and best practices for the business.

4.3 The evolution of the digital supply chain:

Technical design is the stylistic logic of business processes and IT infrastructure, reflecting the need to mix and standardize an organization's operating models. While the demands of some technologies may already be imposed, the challenge is to select and implement digital technologies and integration platforms that use reusable and interchangeable elements in the least amount of time. The widespread use of technologies such as demand pattern analysis, RFID, wireless tracking devices, warehouse labor management systems, fleet management systems, and voice-oriented selection devices for continuous improvement of the supply chain are perhaps the best examples. If a company aims to implement an innovation program, it addresses all five aspects mentioned above in a very consistent and well-thought-out way.

Figure 21 Evolution of the digital supply chain



4.4 The supply chain in the digital enterprise:

This ecosystem is based on the comprehensive implementation of various digital technologies—the cloud, big data, the Internet of Things, 3D printing, enhanced realities, and others. The new business models and the digitization of goods and services, and the digitization and integration of each link in an overwhelmingly company-wide value chain, are common sanctions and include digital geographical point, development and innovation, engineering and production, distribution and digital sales, and customer channels.

Figure- 22 The supply chain at the center of the digital company

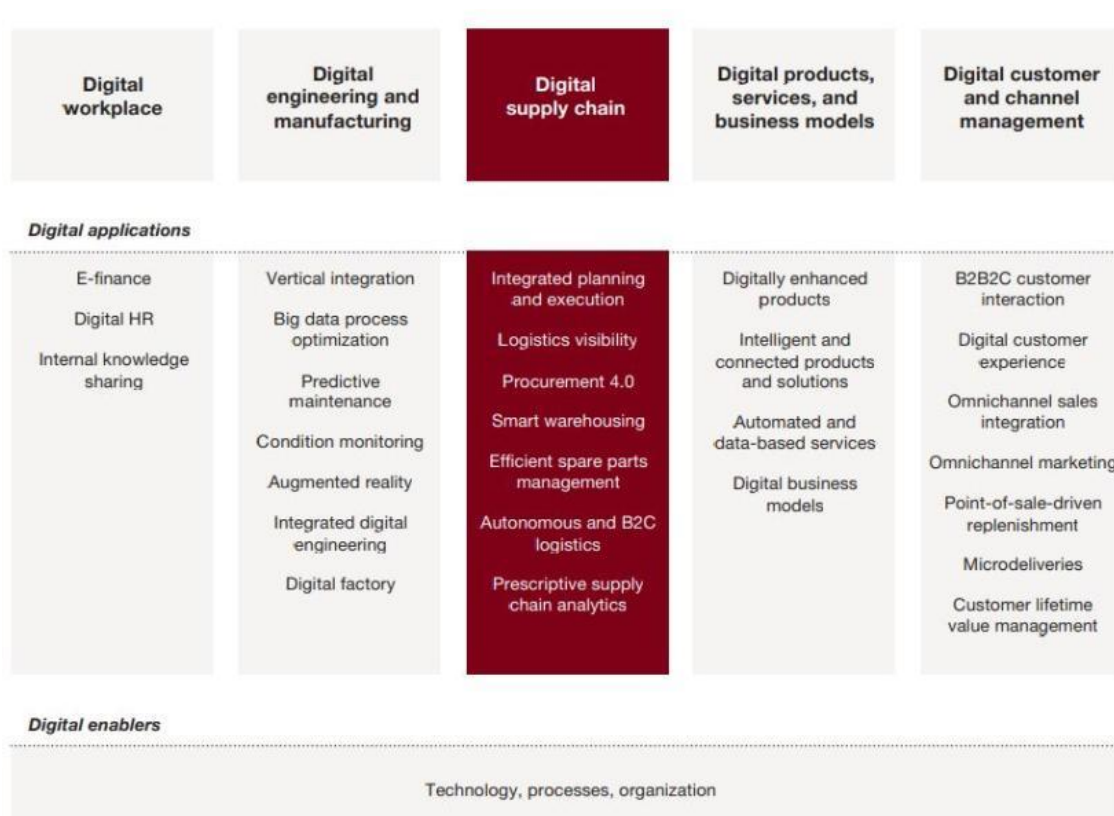


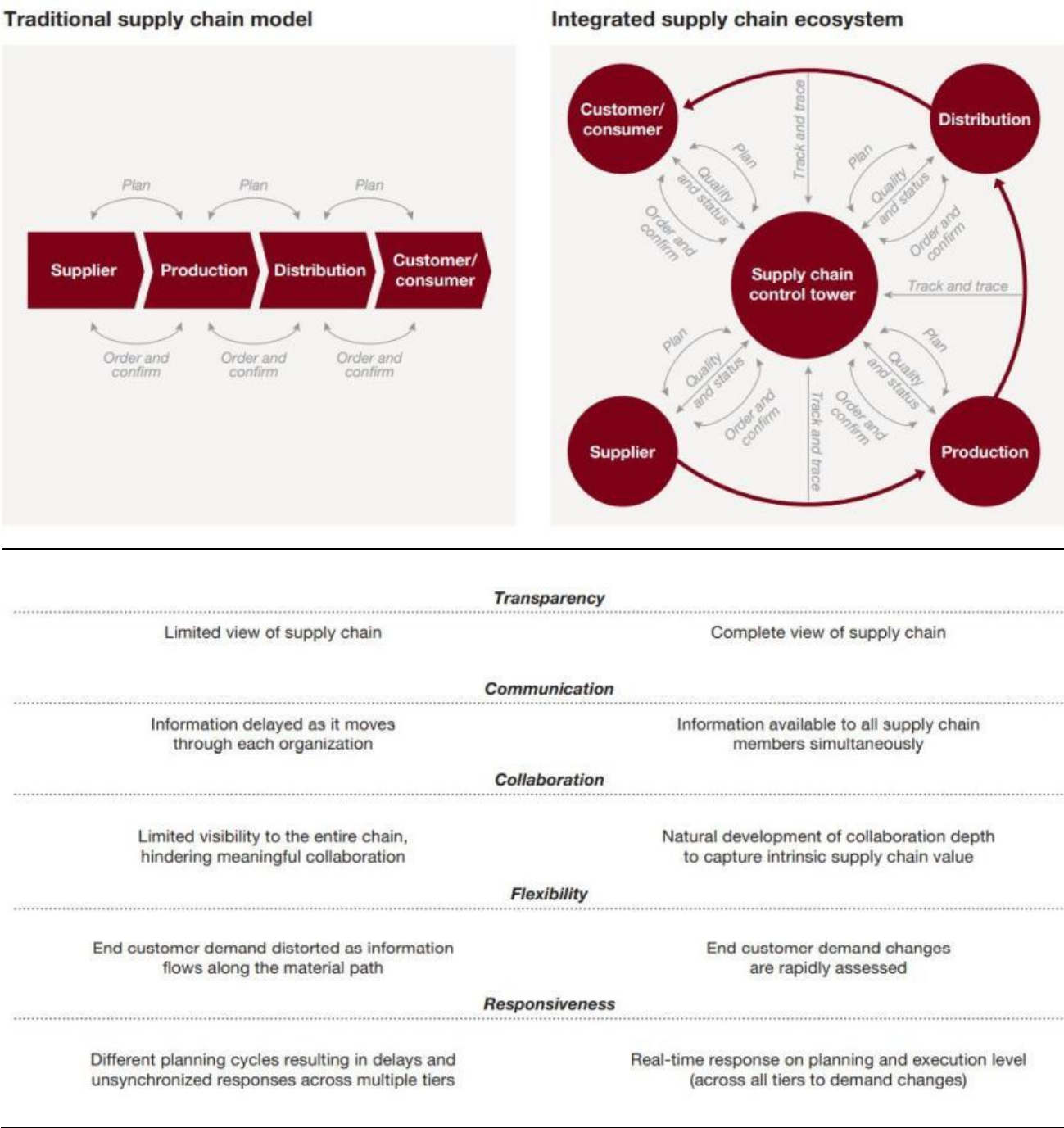
Figure: 23 The long road to Industry 4.0, the digitization of every aspect of business:

Today				
1800	1900	1970s	2015+	2030+
Industry 1.0	Industry 2.0	Industry 3.0	Industry 4.0	Digital Ecosystem
The invention of water and steam powered mechanical production and the beginning of the 1st Industrial Revolution.	Starting mass production with machines powered by electric and combustion engines Introduction of assembly lines.	Advanced automation of production processes with electronic, IT (information technology) and industrial robots Beginning of the information age with electronics, IT and internet	Digital supply chain Smart manufacturing Digital products, services, and business models Digital analytics and operations as a core competency	Resilient and close-knit value chain Virtualized processes Virtualized customer interface Industry collaboration as a key value driver

4.5 The ecosystem of supply which is enabled digitally compared to the conventional linear supply chain:

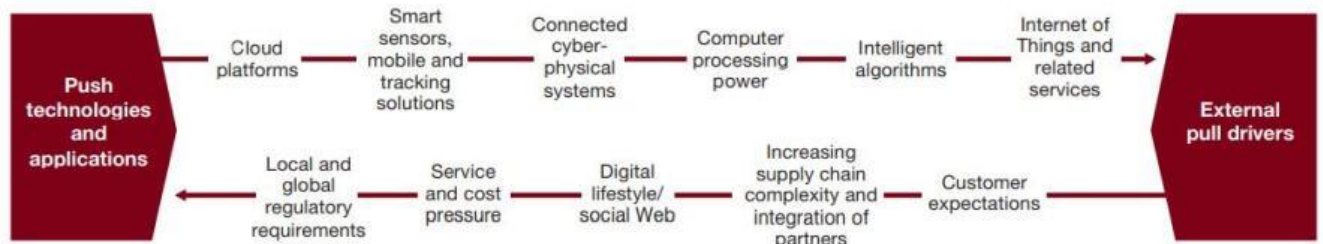
Central to all of these activities is the digitization of the supply chain, which is the key to running each business that will produce or distribute something. In fact, for some companies, their supply chain is their business. It horizontally scales the integration of all corporate functions through a sensor network and knits together with the relevant players (supply of raw materials and ingredients, assembly methods own finished product warehouses and sellers, and finally clients). Social skills monitored through a central management hub have earned an associate's degree managed through a comprehensive information analytics engine.

Figure- 24 Digital supply ecosystem vs. linear supply chain:



Consumers, employees and business partner are pulling companies to create the most exacting expectations for more reliable and reliable supply chains systems.

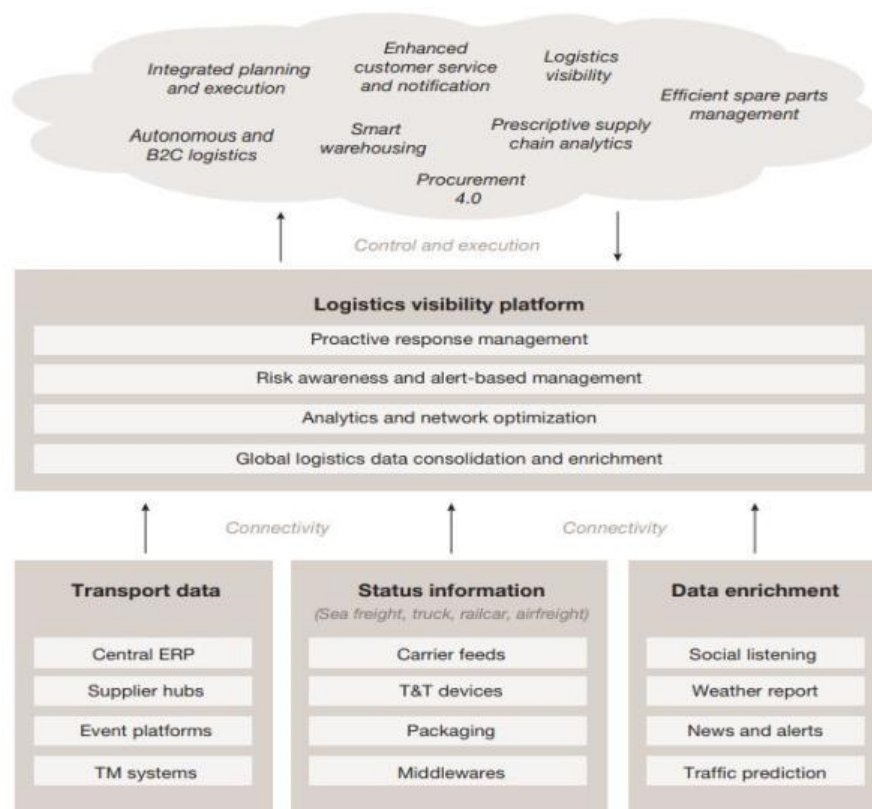
Figure- 25 The impact of push and demand technologies on the digital supply chain



4.6 The logistics visibility framework

Efficient and economical data exchange is the key to success for any supply chain. The old system for the supply chain is full of friction, mainly due to lack of complete and timely information. Unforeseen changes in the demand, shortage of raw materials and natural disasters would rise to the worst of the supply chain plans. The potential for disruption is high. And the outsourcing of several components only makes it harder to fully understand the supply chain, fogging visibility into the transportation network and making it hard to alleviate problems as they arise. Therefore, the most important goal in the digital supply chain is to open the supply chain so that everyone can see it. B2C sells regional operating companies to provide this level of visibility with strict additional information about shipping arrivals along with regular updates. In B2B networks, producers generally expect timely information on shipments that are provided with regional units combined with production planning. Continuously updated and reliable transportation information is to further improve the customer satisfaction of producers.

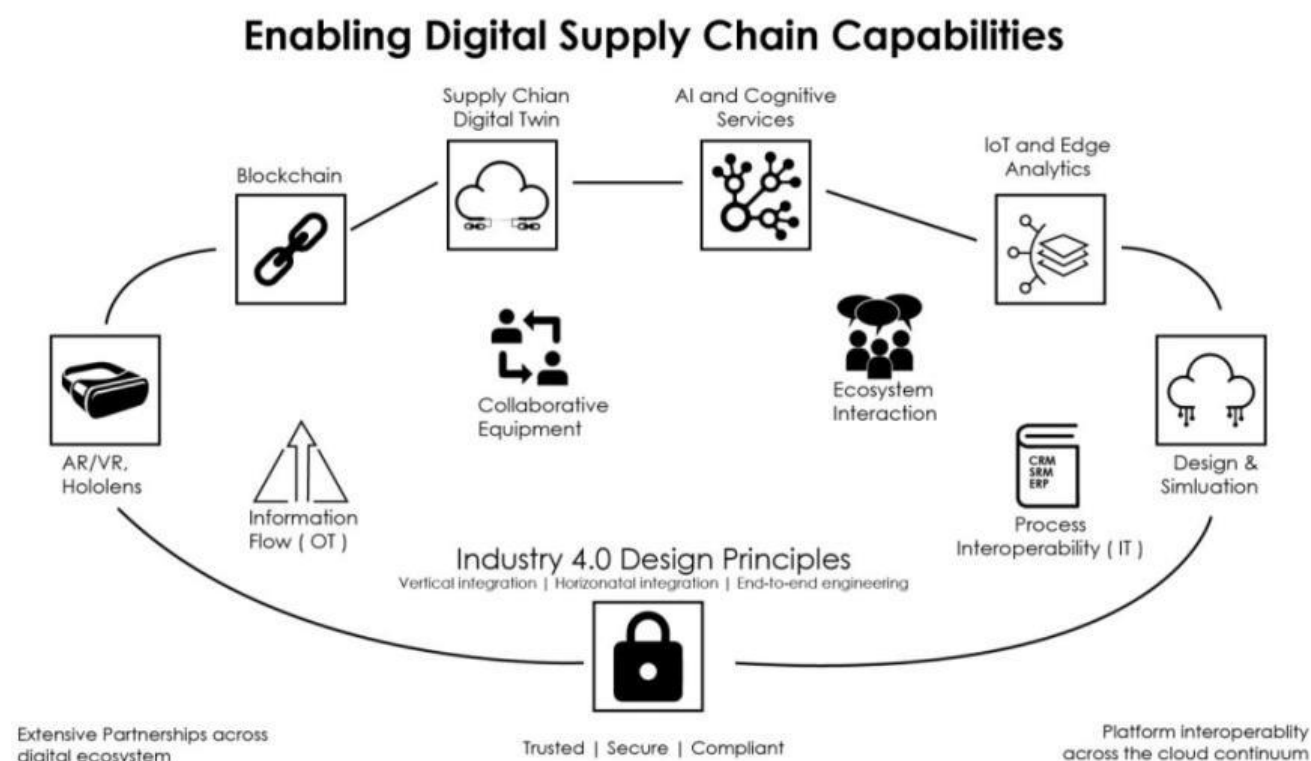
Figure- 26 The logistic visibility framework is driven by a single platform



4.7 Enabling Digital Supply Chain Capabilities:

The development of IR 4.0 is a transfer-based unprecedented disruption to all old business models which hastens the need for a business plan and digitalization. In this context, and the capabilities of the digital supply chain (DSC) are in the early stages. To bridge this gap, a framework for the digital supply chain has been sanctioned (DSCCs).

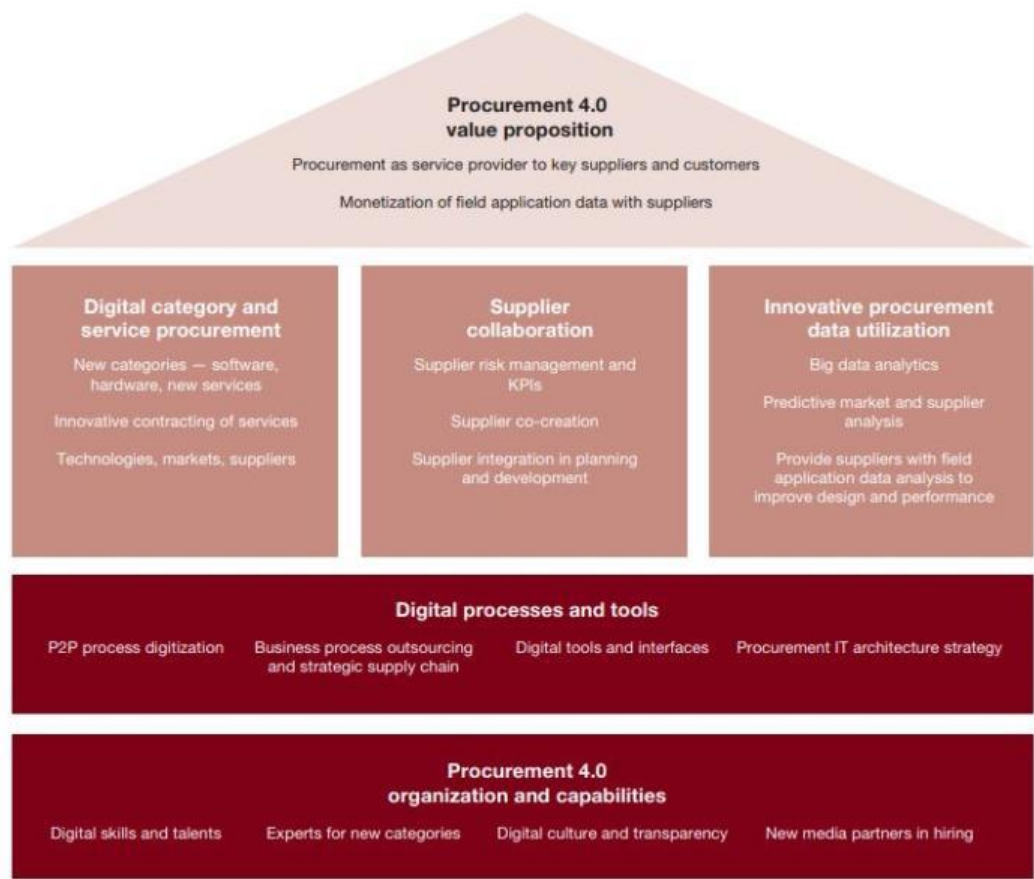
Figure- 27 Digital Supply Chain Capabilities



4.8 Digitizing the procurement function

Digitizing the procurement function can fundamentally change the required tools and capability, add new classes to be provided and remodel the procurement performing value proposition. An essential building block in the digital supply chain system could be the effective integration and management of suppliers of raw materials and components. There is already a way to digitize the many traditional and ancient aspects of procurement. Companies use a range of big data tools and technologies to link suppliers closely, help the design method, improve procurement, manage provider risk actively and boost cooperation. The result is that lower prices and faster delivery are increasingly digitized throughout the supply chain.

Figure- 28 Procurement 4.0



4.9 Maturity Assessment for digital supply chain

Digital maturity assessment permits technical leaders to see and determine wherever their organizations square measure in digital transformation journey and supported the finding from assessment, you'll set the goals for digital transformation. It helps to measure the use of technologies in the company's operations. Digital technology is constantly changing the world, one business at a time. As companies change, the systems they use to communicate and interact with each other are reimagining the supply chain, from how to deploy it to the shipment of goods worldwide. Digital innovation creates new business models where duration, assets, greater visibility, responsiveness, and expectations are fundamental characteristics of the supply chain. But these changes are not easy, and digital innovation doesn't happen in overnight

Figure- 29 Digital supply chain Structure

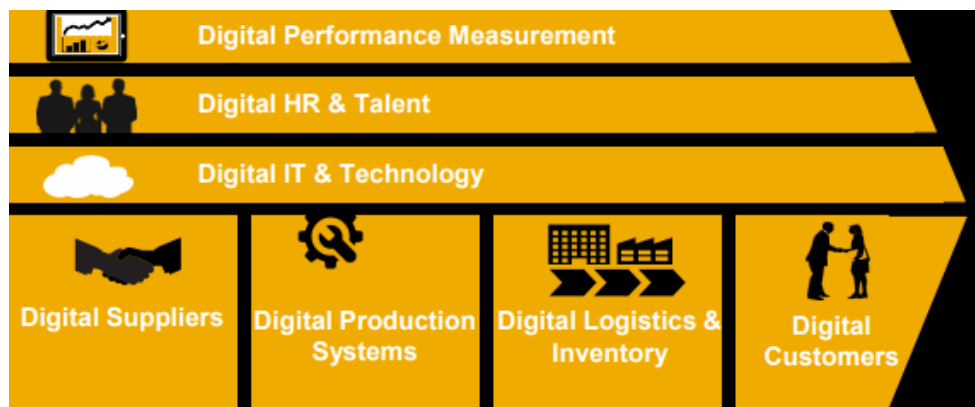
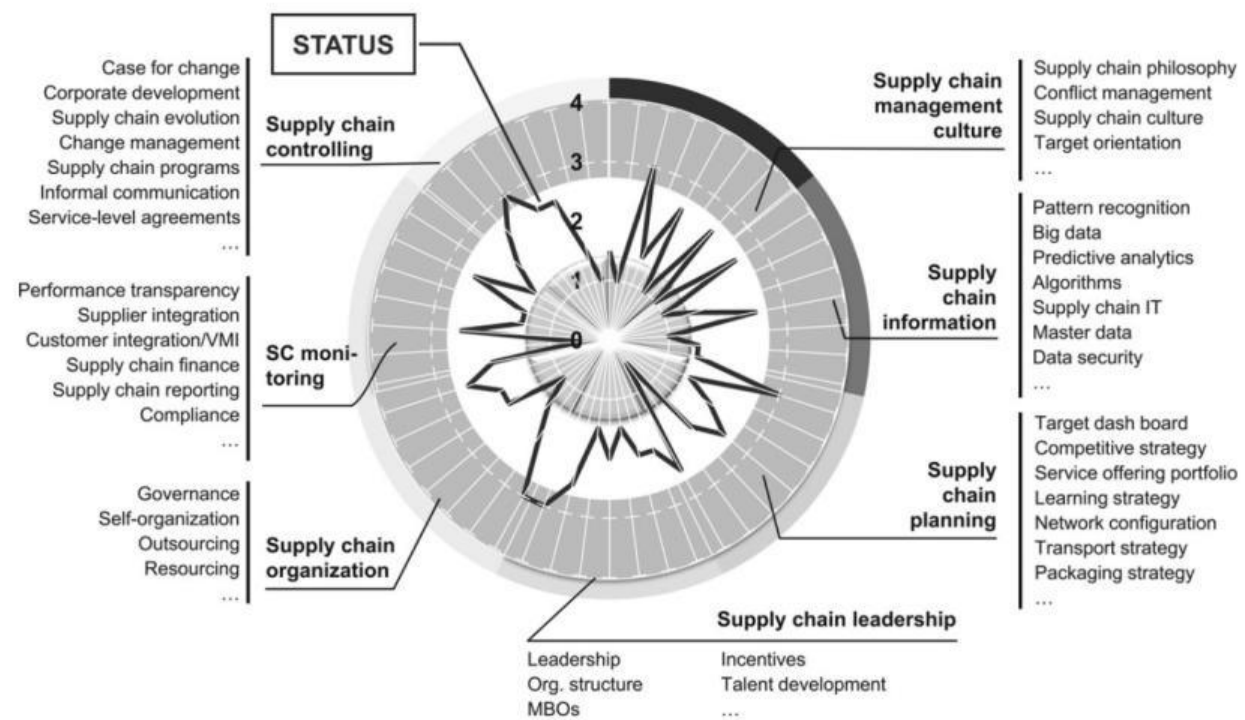


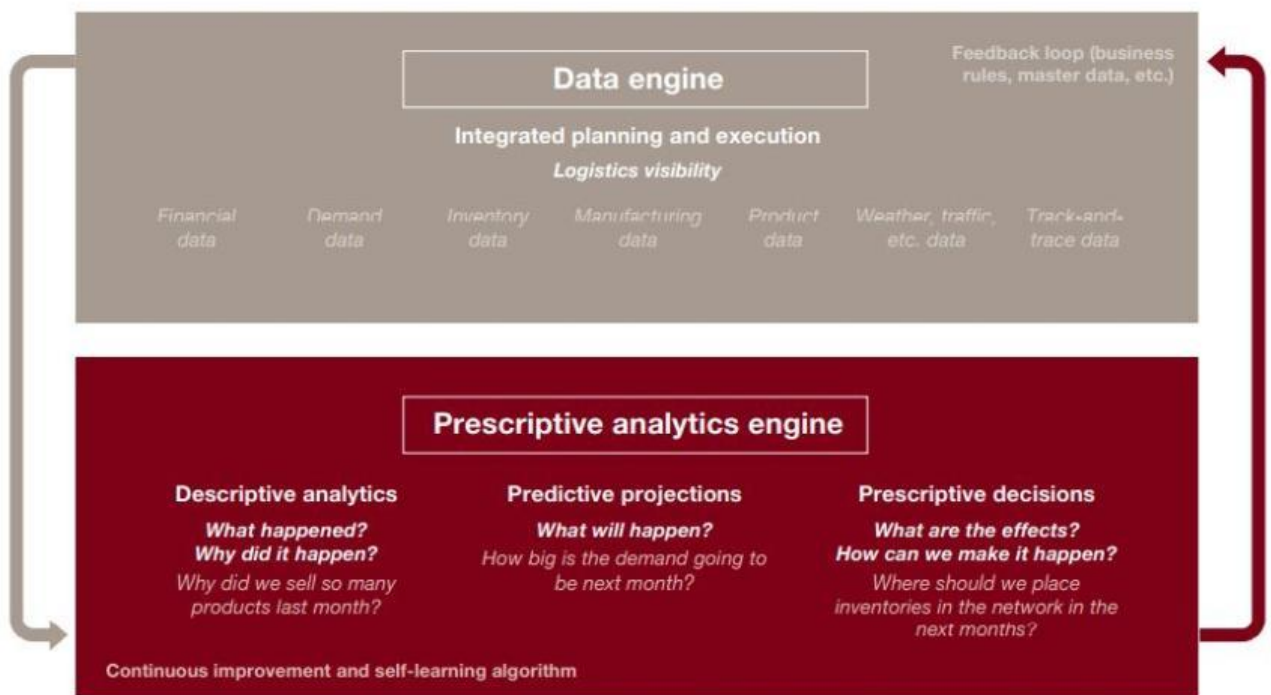
Figure - 30 Maturity Assessment for digital supply chain



4.10 Prescriptive supply chain analytics

The goal of digitizing the supply chain is to fully integrate and visualize both sides of the product's movement. At the heart of an important component of IR 4.0 is Big Data. Prescription analytics systems provide decision support to supply chain managers and even act autonomously on very common decisions. To increase the quality and efficiency of these decisions, companies are poised to shape external data, such as economic indicators, and use self-learning algorithms to help automate their decisions.

Figure- 31 Supply Chain Prescriptive Analytics



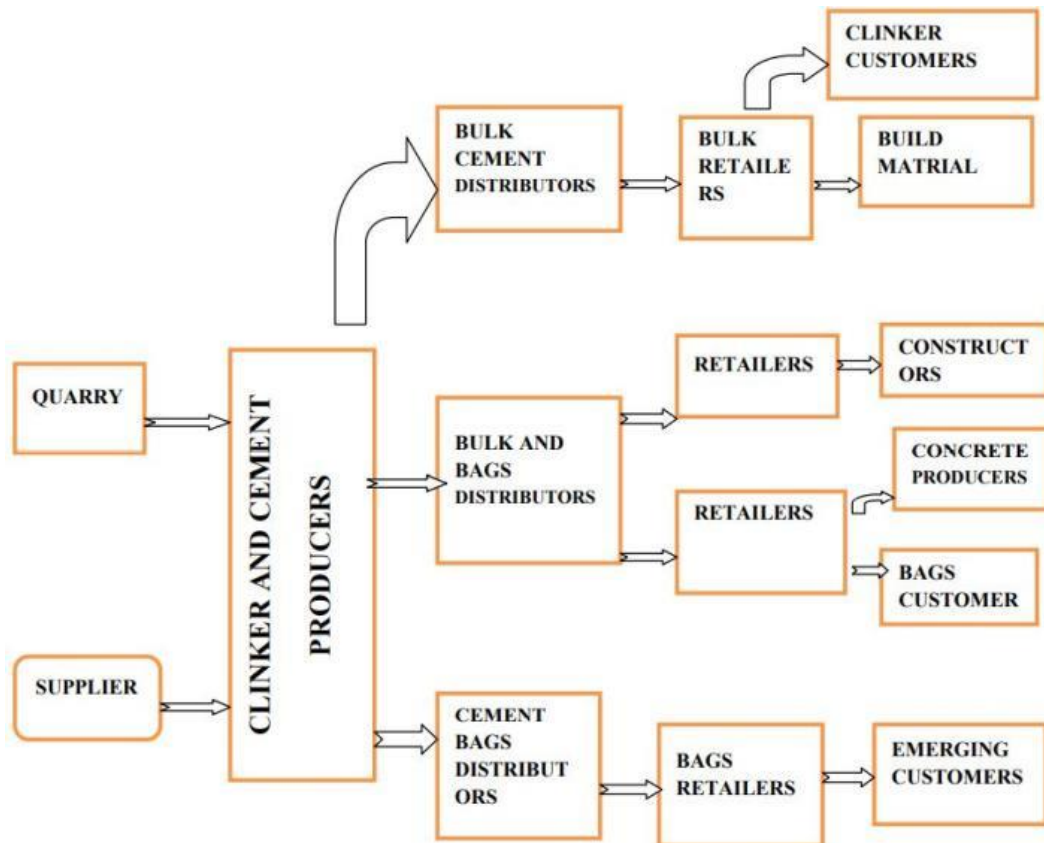
Chapter V

Supply Chain Operating Model of Akij Cement Co. Ltd.

5.1 Introduction:

The nature of the supply chain operating model is analyzed from two perspectives: process and product. Real flows captured by digital fingerprints help greatly improve the visibility of all corporate assets.

Figure- 32 Akij Cement supply chain network:

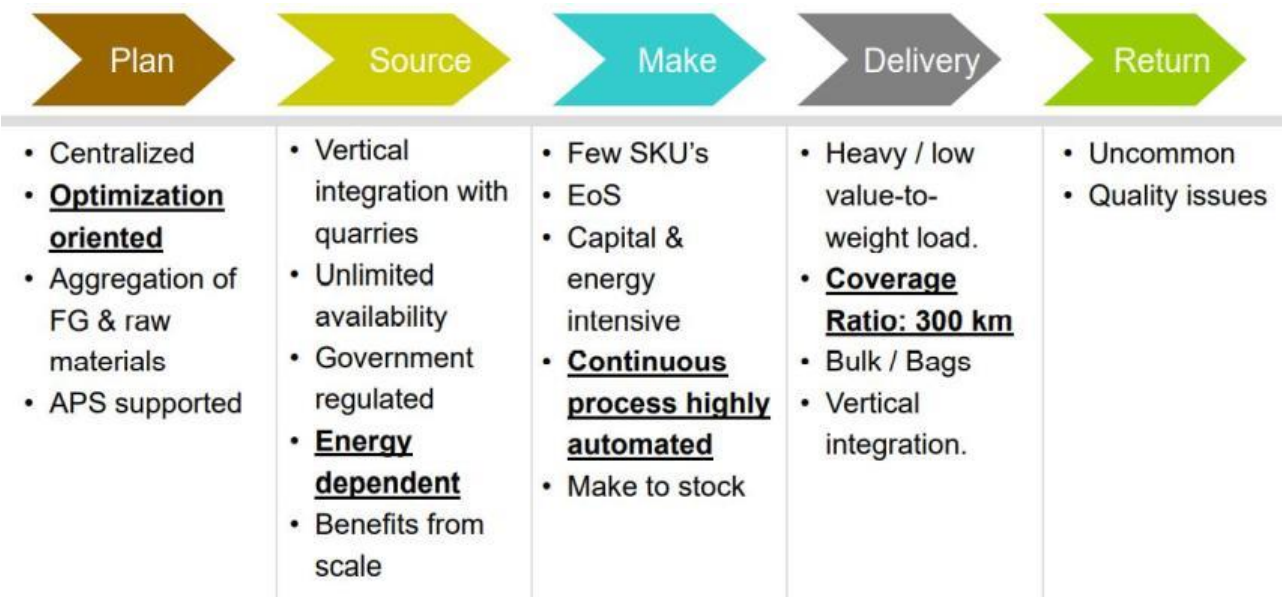


5.2 Processes Analysis

The supply chain council developed SCOR model with the help of seventy of the world's leading producing firms. it's been represented because the "most promising model for offer chain strategic higher cognitive process. the supply chain operations reference model (SCOR) may be a management tool accustomed to address, improve, and communicate supply chain management selections at intervals in a corporation and with suppliers and customers of a corporation.

The following figure shows an overview of the characteristic SCOR model of the ACCL supply chain. In summary, the cement business coming up with a method that is a centralized, optimization-oriented way. Except in some countries where subsoil property laws apply, there are no restrictions on the capabilities of the main raw materials for cement. Cement producing is capital and energy intensive wherever cement truck delivery is restricted due to its low value-to-weight ratio.

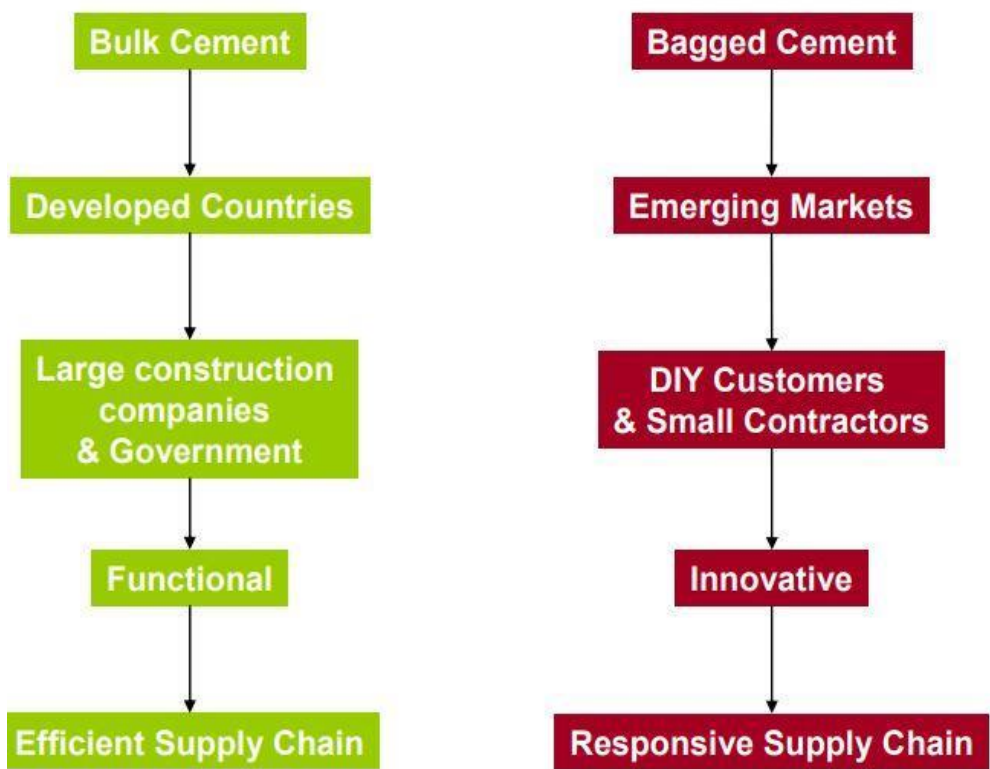
Figure: 33 The Most Recognized Model of SCM is SCOR Model



5.3 Product Analysis:

Cement can be characterized as bulk and bagged as shown in Figure 4. Bulk cement dominates in developed countries, with large construction companies and governments creating demand for it. Meanwhile, bagged cement dominates in emerging markets, and is produced by Do-It-Yourself customers and non-large contractors. Relatively speaking, bulk cement is practical, but bagged cement is an innovation. practical merchandise ought to have an economical supply chain whereas innovative goods ought to have a responsive supply chain.

Figure:34 Product line of Akij Cement Co. Ltd.

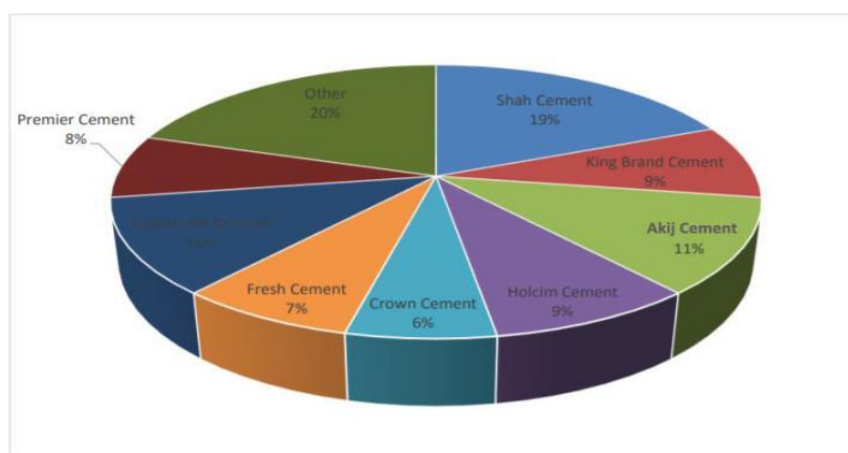


5.4 Competitive Analysis:

Bangladesh's cement business is playing a very important role in the development of infrastructure as its economy has been growing for many years. Although there is competition in the market of our country. As a result of which 123 cement companies remain in the country. Currently, they do not only meet the country's demand, but they are additionally exporting cement also.

International enterprises in cement business operating in our country have immense asset, market channel market share. Not only international enterprises, but also national cement enterprises have many assets. It is good news for our country that local enterprises have an international status for higher production. A chart assuming the share of cement companies in Bangladesh is presented below.

Figure -35 Akij Cement Co. Ltd. Competitive Analysis



5.5 Industry Analysis using POTER'S Five Force Model:

Porter's (1980) Five Forces is a simple tool for understanding the competitiveness of a business environment and for characterizing the potential profitability of a strategy. This is helpful because you are prepared to regulate your strategy as a result after recognizing the power of the setting or business that affects your profits. For example, we can make sure we don't take the wrong action in the future by truly taking advantage of our strong positions or remedying our weaknesses. The five force models are-

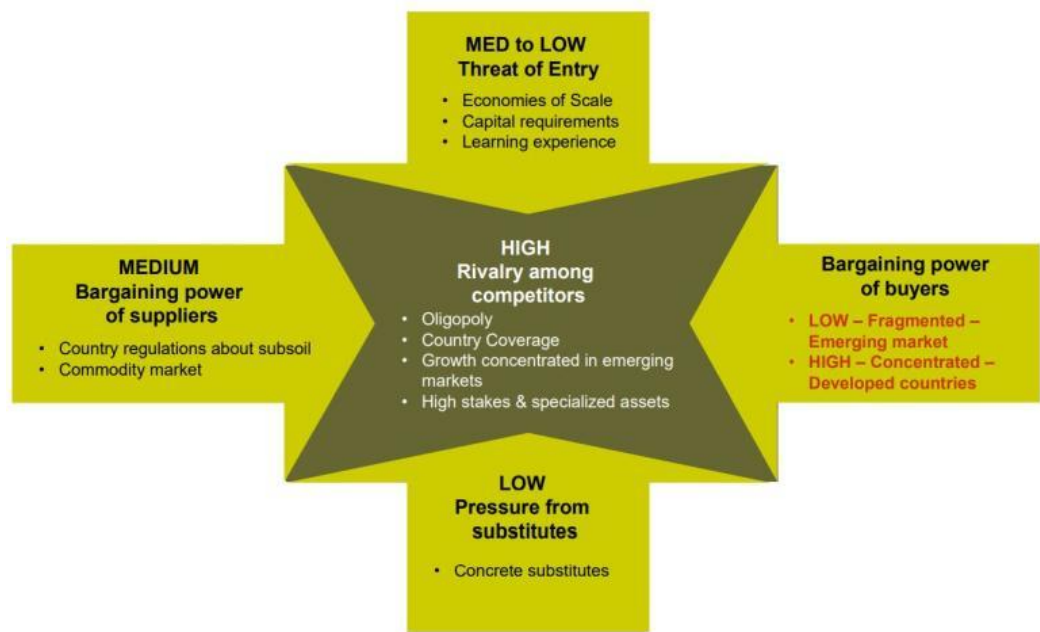
- (1) Threat of New Entrants
- (2) Threat of Substitutes
- (3) Bargaining Power of Buyers
- (4) Bargaining Power of Suppliers
- (5) Current Rivalry

Table-5 Porter's Five Forces in Emerging Markets versus Developed Countries

Competitive Force	Emerging Markets	Developed Countries
Threat of entry	Medium to low	Medium to low
Rivalry among competitors	High	High
Pressure from substitute Products	Low	Low
Bargaining power of buyers	Low	High
Bargaining power of suppliers	Medium	Medium

Porter (1980) suggests that there is a significant opportunity for superior performance when forces are weakened together. Therefore, it can be concluded that cement companies are not attractive in mature markets, but attractive in emerging markets. This figure shows a graphical summary of Porter's five forces that are driving the Akij cement industry competition.

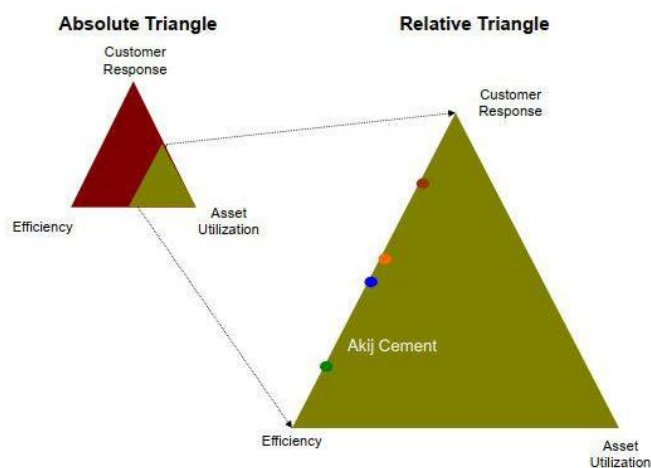
Figure -36 Porter Five force Analysis



5.6 Supply Chain Strategy:

The Supply Chain Excellence framework was created by Larry Lapide in 2006. The operational goals of supply chain (SC) are, in many cases, classified into three groups: asset utilization, customer response, and efficiency. It is easy to assume that the cement trade is focused on concomitant plus exploitation to some degree. The main reason for this place was that it supported economies of scale created by the investment in large local production plants of cement companies with the aim of minimizing prices. This is often a condition given to all major cement companies in the industry. Some cement companies are moving towards two opposing operational goals to achieve market differentiation. One important success issue is that SC conversion is needed to support this decision.

Figure -37 Supply Chain Strategy as per Lapide



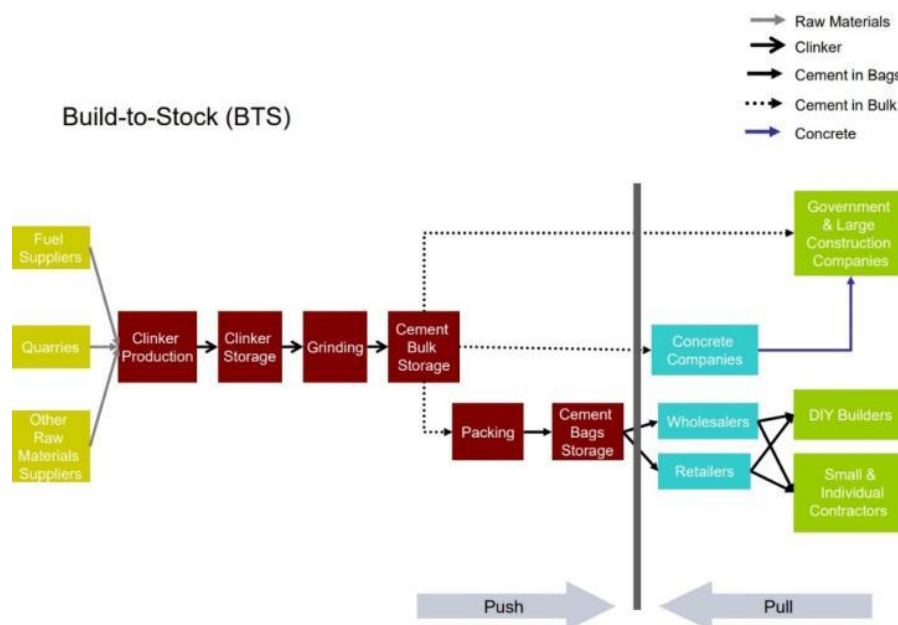
5.7 Push-Pull Supply Chain frameworks:

Two push-pull supply chain frameworks were considered to analyze cement supply chain processes. Four types of supply chain design frameworks (Reeve and Srinivasan, 2005) and matching of supply chain (SC) strategies with product frameworks (Simchi., 2008). There are 4 major supply chain designs:

• Build to-Stock (BTS), • Configure-to-Order (CTO)	• Built-to-Order (BTO) and • Engineer-to Order (ETO).
---	--

Currently, the supply chain of Akij cement industry uses the design of BTS (Build to Stock) to deliver orders in the central warehouse, and the lead time to the consumer is only the transportation time, and the degree of choice of the customer is very high. Limited.

Figure:38 push-pull SC Framework



5.8 SWOT Analysis

SWOT Analysis (or the SWOT matrix) is a structured design technique that assesses all four components of a company or project or enterprise, and represents strengths, weaknesses, opportunities and threats. For a company, product, location, industry or person, a SWOT analysis can be done.

SWOT analysis groups key pieces of information into two main categories:

- Internal factors – internal strengths and weaknesses of the company
- External factors– Opportunities and threats brought by the external environment to the company.

This below table presents a comprehensive floor plan of the company's key strengths and weaknesses and potential opportunities and threats. According to the study, Akij Cement Company Ltd. SWOT analysis is following: **Table-6** SWOT Analysis

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Quality control and high quality product	Distribution set up cannot cover the whole country yet	Opportunity for export	Presence of new competitors
Machineries and Technology of European standards	Company cannot achieve their target market share yet	spread marketing & distribution channel	Price of Raw material increase in International market
High level of training and Best management practice	Poor structure of the HR department	Creation of e-commerce channel	High price of Finish Product
Good location and Large marketing team	Low level of marketing	Great potential for growth and profitability	Weak road linkages result in delayed distribution

5.9 PESTLE Analysis:

Every process of change begins with an analysis of the current situation. The external factors that affect the company are of particular importance. One area of analysis, the technological factors, is directly relevant to the topic of digital transformation. To see the overall picture, however, you have to think through all six areas of the PESTLE analysis. The factors and their analysis are given below:

Political:

The cement price is primarily controlled by the following rates, mainly government-controlled:

• Coal rates • Power tariffs • Carriage charges (Railway and road tariffs)	• Royalty and access on limestone • Taxation (Excise duty and VAT)
--	--

- In addition, most government offer tax incentives in the form of sales tax exemptions or deferrals, to attract investment in their respective states.

Economical:

Cement demand is commensurate with the nation's GDP growth.

At present, the industry is booming and Covid-19 is postponing many governments infrastructure and housing projects.

Social:

- The cement manufacturing units- with a slight regional imbalance -is spread all over Bangladesh
- Looking at the growth rate of Bangladeshi cement industry and capacity expansions, it is expected that cement industry will create good number of jobs in the next 4-5 years.

Technological:

From mining to production, the entire process depends on technology.

- The dry process quickly substitutes the moisture. It reflects growing energy conservation requirements, and suggests the long-term truth cement plant and its future.
- In the cement kiln and chamber technological development will support cement kilns in the use of scraps such as tires etc. which could lead to a reduction in the use of highly expensive fuels such as coke, coal etc.

Legal:

- Proper legal procedure is required for the acquisitions of Land and limestone mining, setting up the integrated grinding units.

Environmental:

- Bangladesh has 110 mg/Nm³ and 80 mg/Nm³ of stack emissions for plants located in critically polluted areas from various sources for existing cement plants.

- As cement production is a highly emission energy-intensive process, state-of-the-art equipment must be used to achieve energy efficiency and comply with environmental standards.

Figure -39 PESTLE Analysis



Chapter VI

Digital Supply Chain: Akij Cement Co. Ltd. perspective

6.1 Introduction:

Akij Cement Co. Ltd. a large cement manufacturing company in Bangladesh enter the era of digital Supply chain started working for Digital transformation four years ago and looking to better anticipate and serve customer needs, improve supply chain agility and reliability, and use supply chain excellence.

Akij Cement Developed Enterprise Resource Planning (ERP) solution and AI and ML are part of the operational supply chains. Akij Cement seeks to enhance business performance and provide superior business continuity focused on three key areas – robustness of the supply chain, operating excellence and cost efficiency.

6.2 Technologies uses in ACCL to enabling Digital Supply chain:

The following sections re-evaluate the various digital and aid initiatives being considered and way they'll be used:

6.2.1 Enterprise Resources Planning (ERP):

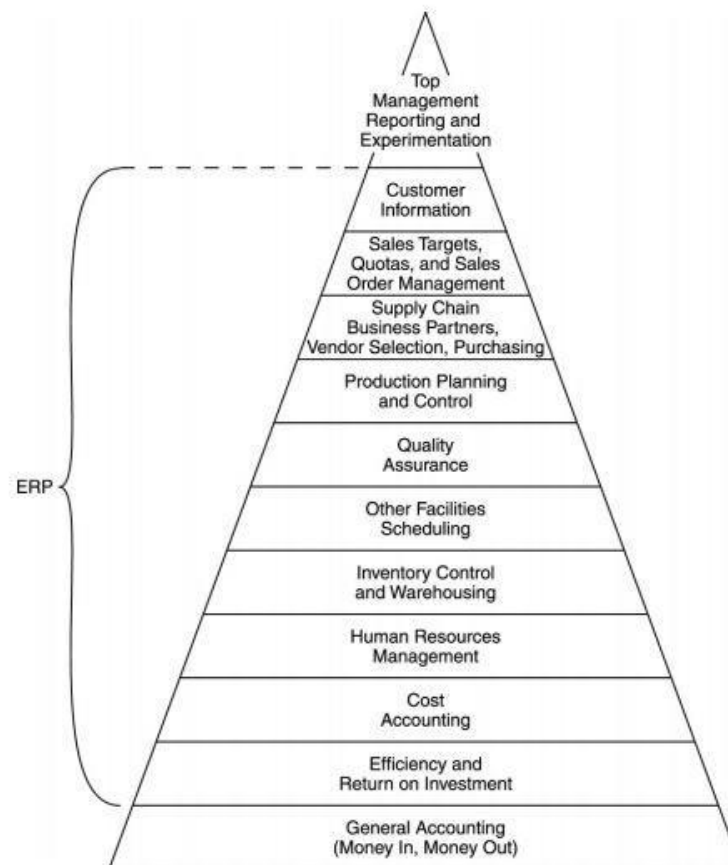
E R P is a kind of software package used by organizations for managing day-to-day activities including accounting finance, Purchasing, project, commercial, risk and compliance management, and supply chain operations management. This includes the ERP. ERP suite includes management of corporate performance, to plan, budget and predict the results of the financial situation of an organization.

Figure- 40 ERP



ERP systems connect and perform to enabling data flow between multiple business processes. ERP eliminate data duplication and provide data integrity and consistency from a single data source and collecting, combining and shared data from multiple sources.

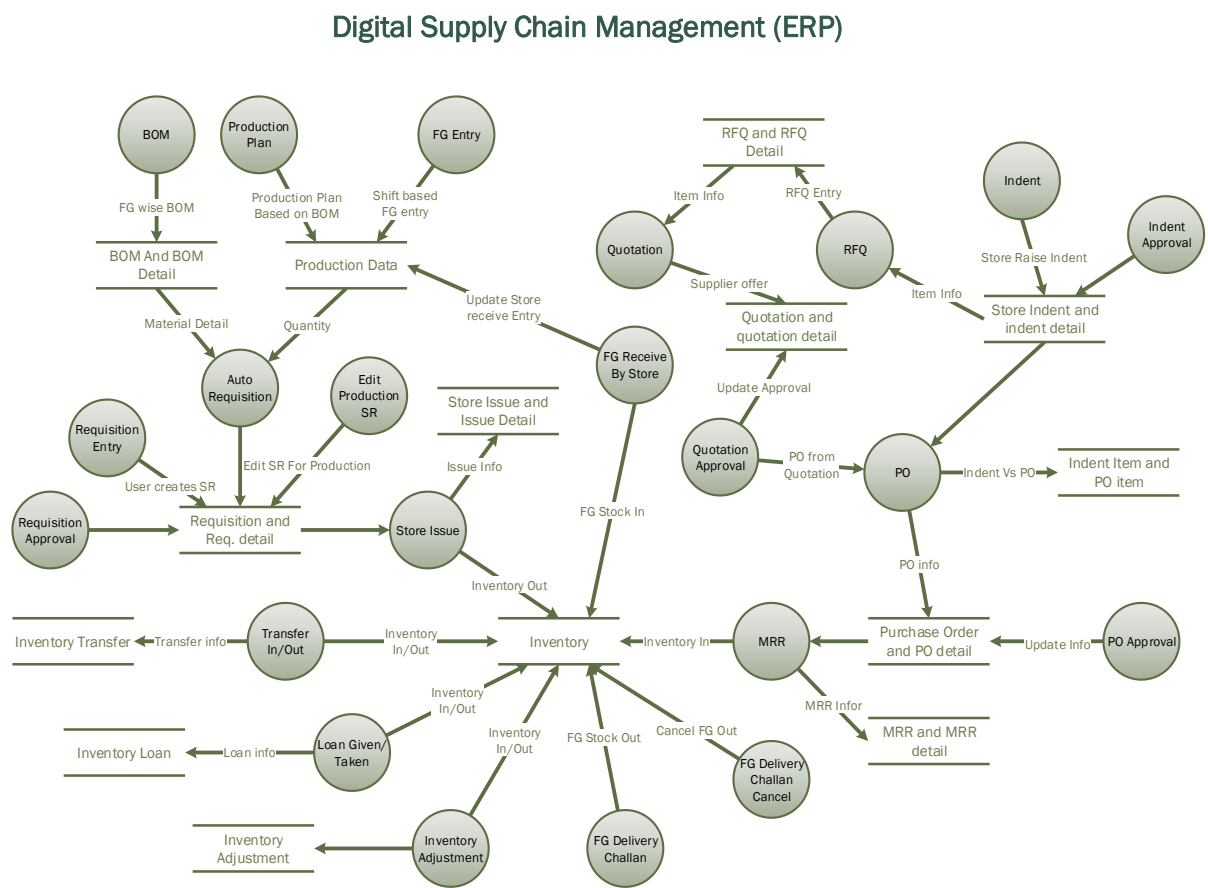
Figure- 41 Some senior and all middle management concerns are addressed by ERP Solutions



ERP digital Supply Chain includes the following modules:

- A) Automated Purchase Requisition
- B) Automated Supplier Comparative statement
- C) Digital Procurement and Payment
- D) Automated Material or Service Receiving
- E) Digital Inventory Management
- F) Digital Supplier Management
- G) Automated Invoicing Processing
- H) Automated Notifications

Figure: 42 Digital Supply Chain Management Process Flow in ERP



6.2.1 A) Automated Purchase requisition:

Akij ERP solution provides fully automated Purchase Requisition based on History and consumption analysis and MRP.

Figure: 43 Purchase Requisition Entry in ERP

Purchase Requisition Entry :

WH Name: Item List: Refresh Qty:

QC Person: Purpose: Due Date:

Type: Department: Add Submit

Upload Excel File

SL	Item ID	Item Name	UoM	Currt.Stock	SafyStock	Purpose	Indent Qty.	Prv.Rate	
1	29346	Ball Pen Red - - - - -	PCS	21.0000		For new project	10		Delete
2	14954	Stapler Machin Munix-25106 - - - - -	PCS	1.0000		For new project	1		Delete

Figure: 44 Purchase Requisition view in ERP

[Print](#)



Akij Cement Company Ltd.
ACCL Central
Purchase Requisition

Indent No: **463804** Indent Type: **Local** Indent Date: **01-03-2021** Due Date: **08-03-2021** [Excel](#)

SL	Item ID	Item Name	UoM	Quantity	Current Stock	Last Price	Remarks
1	557765	Head Phone -H-110 - - - -Logitech	PCS	5.00	6.00	725.00	Usable for Official Purpose, Month of March-2021
2	21086	Computer Mouse (Model: OP-720) - - - - -	PCS	5.00	4.00	260.00	Usable for Official Purpose, Month of March-2021
3	21083	Key Board (Model:KR-83) - - - - -	PCS	5.00	5.00	525.00	Usable for Official Purpose, Month of March-2021
4	566077	Toner Cartridge HP 26A(CF 226A) - - - - -	PCS	8.00	8.00	9,300.00	Usable for Official Purpose, Month of March-2021
5	21139	Multi Plug 5 Ponit - - - - -	PCS	5.00	6.00	400.00	Usable for Official Purpose, Month of March-2021

Indent By: **MD MEHEDI HASAN BHUIYAN, Officer (Store) [3/1/2021 3:11:30 PM]**
 Approved By: **MD HASANUZZAMAN, General Manager (HR & Admin) [3/3/2021 9:29:37 AM]**
 Accounts Approved By: **Rakibul Alam Khan, Deputy Manager (Accounts And Finance) [3/7/2021 4:38:24 PM]**

6.2.1 B) Automated Supplier Comparative statement

On the other hand RFQ/RFP/RFI has been send through the online Supplier Portal where an individual supplier can Login and find the open request of RFQ or purchase Order. Supplier input the asking material price as per quotation. System automatically calculates all supplier's quotation and generate a comparative statement.

Figure: 45 Supplier Automated Comparative Statement in ERP

RFQ: [Show](#)

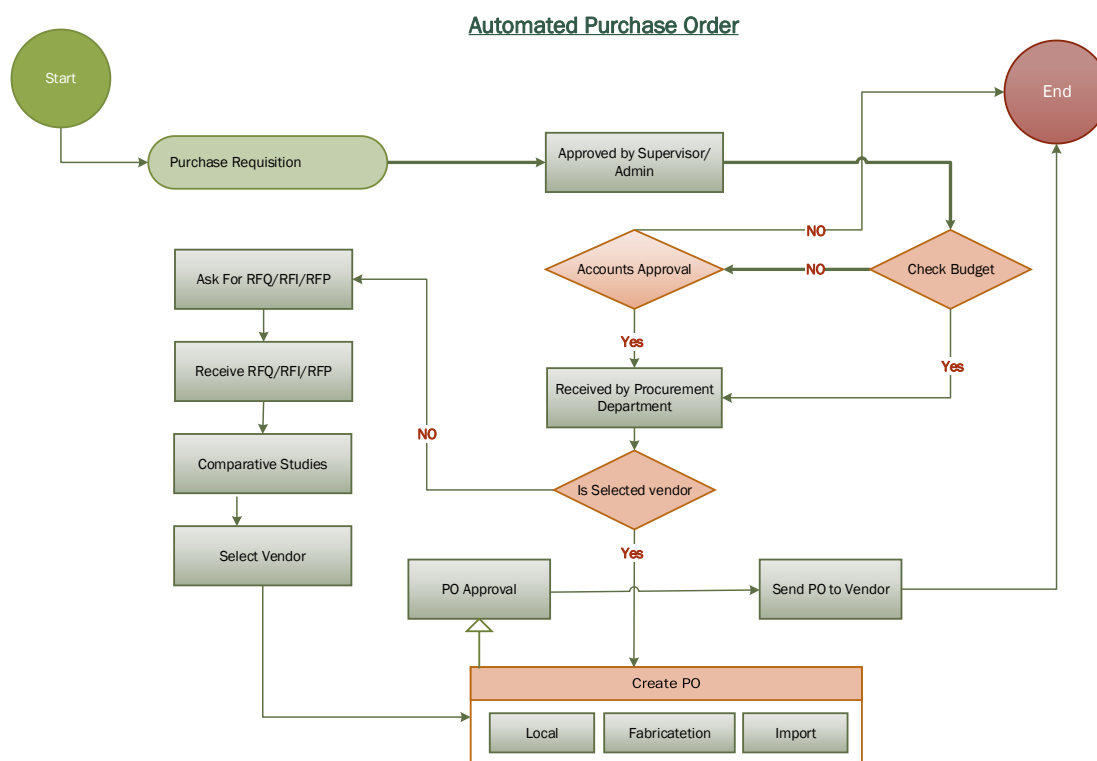
SN	Item Id	Item Name	UoM	RFQ Quantity	AIT TEST Enterprise (TEST Supplier)		Test Supplier for AIT Test new	
					Rate	Total	Rate	Total
1	27670	S S Welding Rod 3.2mm - - - - -	PKT	1	11	11	12	12
2	480912	MS Welding Rod 3.2mm Vortic Marine - - - - -	PKT	1	10	10	11	11
3	557978	Welding Rod 4mm Vortic Marine - - - - -	PKT	1	12	12	13	13

Supplier:
 Remarks:
[Submit](#)

6.2.1 C) Digital Procurement Management:

Automated procurement automates repeatable tasks to spice up potency and scale back costs; it equips stakeholders across the business with time period insights and analytics through AI (AI) and easy-to-use on-line tools; it deploys new and smarter ways that to infuse information models to complement day-after-day operations.

Figure: 46 Purchase Order Process Flow



Purchase orders has been generated upon historical data, Selected supplier, Item and previous price or against Purchase Contract than wait for approval as per rules (within -5,00,000 auto approve and over 5,00,000 need approval of head of Procurement). Orders can be easily approve from anywhere and any devises through apps or ERP. Upon Three way matching principles while generating Purchase invoice the system automatically generates and send it to bank via mail for payment..

Figure: 47 Auto generated Purchase Order sample in ERP

[Print](#)

Akij Cement Company Ltd.
Akij House, 198 Bir Uttam, Gulshan Link Road, Tejgaon, Dhaka-1208.

Purchase Order

[e-mail](#) [Download](#)

Purchase Order No: **1267388** Date: 01-04-2021

Supplier: AIT TEST Enterprise (TEST Supplier) Email: bony@akij.net Attn: BONY Phone: Address: Akij house	Ship To: AFBL Workshop BIN No. VAT Reg No. PR No.	Bill To: Akij Cement Company Ltd. Akij House, 198 Bir Uttam, Gulshan Link Road, Tejgaon, Dhaka-1208. 00000557-0006 N/A 467490
--	--	--

SL	ITEM	DESCRIPTION	UoM	QTY.	RATE	VAT	AIT	TOTAL
1	Fuel Filter Part No-2200 900 - - - - - Part No-2200 900		PCS	5.00	100.00	0.00	0.00	500.00
						Total	0.00	0.00

Partial Shipment	False	Transport Charge	0.00
No of Shipment	1	Others Charge	0.00
Last Shipment Date	04-04-2021	Gross Discount	0.00
Payment terms	Credit	Commission	0.00
Payment days after MRR	21	Grand Total	500.00
No of Installment	1		
Installment Interval (Days)	0		
Warrenty after delivery (months)	0		

In Word : BDT Five Hundred Only

Others Terms:
na

Prepared By: Debashish Debnath, Assistant Manager, Planning & Implementation
 e-Approved By: Abdullah Al Masud, General Manager, Purchase
 If you have any query please call our Toll Free Number : **08000016609**
 Please send your invoice to: **invoice@akij.net**

Figure: 48 Payment Process Flow in ERP

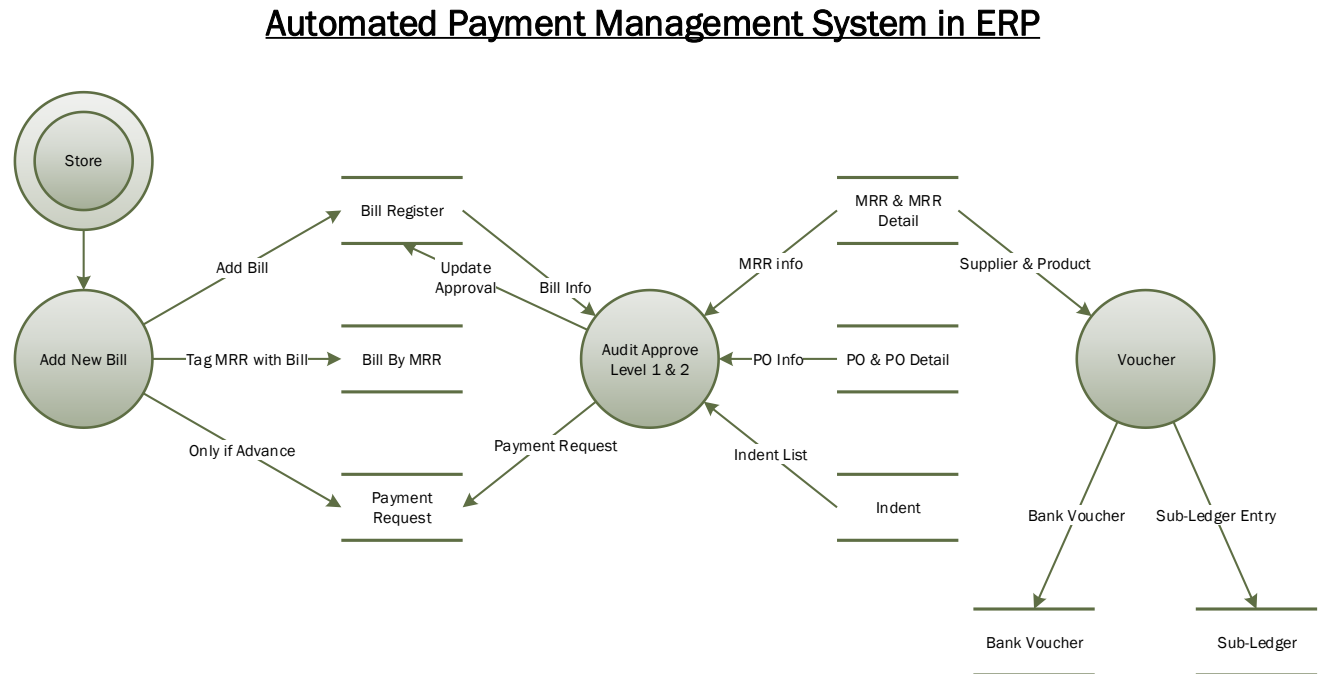


Figure: 49 Payment Register in ERP

erp.akij.net/Accounts/Advice/PaymentAdvice.aspx

PAYMENT ADVICE FORM

Date : 2021-04-05 Advice Type : Party Advice Unit Name : ACCL
 Acc. Mandatory : Yes Advice Bank : SCB Voucher Posting : All

Account No. : 01114617101 [SCB] [Submit] [Show Report] [Advice Print] [Voucher Print] [Party Email]

Account Name	Code No	Bank Name	Branch	A/C Type	Account No	Amount	Payment Info	Comments	Routing No	Instrument No	SL No	Debit Account
Akter Store	78904	AB Bank Limited	Nawabpur	Saving	4013788746000	8,000.00	ACCL-B-01APR21-3943	BP-APR21-100	020274724	ACCL-APR21-179	1	'01114617101
Mohammed Masum Entarprise	28020	Islami Bank Bangladesh Limited	Narayanganj	Saving	1080100364413	7,500.00	ACCL-B-01APR21-3954	BP-APR21-101	125671185	ACCL-APR21-180	2	'01114617101
All Enterprise	38154	Shahjalal Islami Bank Limited	Nawabpur Road	Saving	403911100000095	7,000.00	ACCL-B-01APR21-3952	BP-APR21-102	190274559	ACCL-APR21-181	3	'01114617101
M/S Shawan Enterprise	4691	Islami Bank Bangladesh Limited	Nitaganj	Saving	3400100099918	652,513.50	ACCL-B-31MAR21-3834	BP-APR21-105	125671277	ACCL-APR21-184	4	'01114617101
Shun Shing Packaging Industries Limited	43339	IFIC Bank Limited	Gulshan	Saving	1002710226001	1,021,086.00	ACCL-B-31MAR21-3828	BP-APR21-106	120261729	ACCL-APR21-186	5	'01114617101

6.2.1 D) Automated Material or Service Receiving

Through ERP material or services are easily received. When a material reached in to Factory premises then a get entry has been inputted and an automated notification has been sent to the officials.

Figure: 50 Automated Material receive in ERP

[Print](#)



Akij Cement Company Ltd.

ACCL Central

Material Receive Report

Challan No: Nil Challan Date Type: 16-02-2021 Supplier Name: ELECTRONICS ZONE
 MRR No: 1012474 MRR Date: 01-03-2021

SL No.	ID	Item Description	UOM	PO Quantity	Receive Quantity	Rate	Amount(BDT)	Remarks
1	28378	Pako Battery 9v	PCS	30.00	30.00	35.00	1,050.00	
Total:							1050	

MRR By: **MD.ABDULLAH AL MAMUN, Officer**

SL No.	Document Type	Document
1	MRR Challan	/ERP_FTP/892950.jpg

Figure: 51 Material receive UI in ERP

Warehouse: **ACCL Central** PO:

PO Type: **LOCAL** Select-PO: **19980 , Smart Stationery** Invoice No:

Challan/BOL: Challan Date: VAT Challan:

VAT Amount: Upload: No file chosen

Gate Entry No:

Supplier: **Smart Stationery** Currency: **BDT** Conversion: **1.0000**

MRR No: PO total Vat: **0.00** Product Cost: **5500.00** Transport Cost: **0.0000** Other Cost: **0.0000** Discount: **0.0000**

SL No.	Item ID	Item Name	Description	UoM	PO Qty	Rate	Value	VAT	QC Passed	Previous Receive	Receive Qty	MRR Value	Previous Location	Present Location
1	67893	Arch File (Size : 2") - - - - -		PCS	50.00	110.0000	5500.0000	0.0000	0.00	0.0000	0		ACCL Central Container-1 Rack-B Bin-60	ACCL Central Container-1 Rack-B Bin-60

6.2.1 E) Digital Inventory Management:

Akij ERP provides digitalizes inventory system. In this system inventories are automatically increase and decrease in the time material receive and Issues. While Any department raise a requisition ERP automatically notify the warehouse in charge and dispatching Materials RFID tag triggers the material and count it then automatic issue entry to in software with auto generated code. In some cases also uses Artificial Intelligence (AI) for counting the Inventory.

Figure: 52 Automated Inventory Reports ini ERP

Inventory Statement Report

Unit Name: **ACCL** From Date: **2021-04-01 00:00** To Date: **2021-04-05 23:59** Ware House: **ACCL Central**

Search By: **Commodity** Type: **PRODUCTION RAW**

100%

Akij Cement Company Ltd.
ACCL Central
Inventory Statement

From 01/04/2021 to 05/04/2021

SL	Item ID	Item Name	UoM	Opening Qty.	Opening Value	Receive Qty.	Receive Value	In Adj Qty.	In Adj Value	Issue Qty.	Issue Value	Out Adj Qty.	Out Adj Value	Closing Qty.	Close Value
1	11233	Cement Clinker	TON	1431597.3764	4826261.261.6475	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	1431597.3764	4.826.261.261.65
2	6242	Clinker Granular	TON	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.00
3	566401	Grinding Aid (Cement Additives)	TON	40.1580	3763597.9640	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	40.1580	3.763.597.96
4	362425	Grinding Aid (Cement Additives) ACC 856	TON	0.0030	414.3318	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	0.0030	414.33
5	334115	Grinding Aid Mapei (c-61)	TON	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.00
6	11235	Gypsum	TON	60906.6525	133066922.7837	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	60906.6525	133.066.922.78
7	6246	Lime Stone 3/4"	TON	359069.8771	379366432.3234	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	359069.8771	379.366.432.32
8	244866	Slag & Lime stone	KG	4.7000	1485.0167	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	4.7000	1.485.02
9	6243	Slag Blast Furnish	TON	333706.5539	537747928.4262	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	333706.5539	537.747.928.43
Grand Total				2185325.3209	5880208042.4933	0.0000	0.00	0.0000	0.0000	0.0000	0.00	0.0000	0.0000	2185325.3209	5.880.208.042.49

6.2.1 F) Digital Supplier Management

Akij Cement uses online supplier portal for supplier management where an individual supplier can login and find the open request of RFQ or approved purchase Order list. Through Business Analytics it can be very easy to measure Supplier performance.

Figure: 53 Digital Supplier Management

Suppliers Manage your Suppliers

All your Suppliers + Add

Show entries Search: Action

Contact ID	Business Name	Name	Contact	Total Purchase Due	Total Purchase Return Due	Action
CO0003	Abir General Store	Abir	01306069410	৳ 11,368.00	৳ 0.00	Actions
CO0004	Shatu Bhandar	Olyampick Industries Ltd	01793001800	৳ -0.38	৳ 3,884.73	Actions
CO0005	M/s Ariva Traders	M/s Ariva Traders	01726363815	৳ 0.00	৳ 7,410.00	Actions
CO0006	Dhaka Traders	Dhaka Traders	01911353597	৳ 0.00	৳ 5,267.96	Actions
CO0007	M/S Shaidul & Brothers	M/S Shaidul & Brothers	01819530945	৳ 0.00	৳ 0.00	Actions

Figure: 54 Contact List in Digital Portal

AKIJ CEMENT ADMIN

CONTACT LISTS +Add New Contact

CSV Excel PDF Print Column visibility

Show entries Search:

Name	Information	Email	Phone	Engineer's Birthdate	Status	Total Sites	Reward Point	Wife's Name
Sajal Chandra Chanda	Designation:Engineer Email: nisharga15@gmail.com Phone: 01711262748	Email: nisharga15@gmail.com	01711262748	1979-7-10	De-Activate	Total Sites:12 Pending: 7	4160	Avronil Chandra
Mohammad Rajibur Rahman	Designation:Engineer Email: rahmanrajibur83@gmail.com Phone: 01912234083	Email: rahmanrajibur83@gmail.com	01912234083	10/15/1977	De-Activate	Total Sites:4 Pending: 0	2300	Feruza Khatun
Md.Khalid Hasan	Designation:Engineer Email: engkhasan@gmail.com Phone: 01928323000	Email: engkhasan@gmail.com	01928323000	1991-7-26	De-Activate	Total Sites:32 Pending: 0	25018	Jannat H Oltizzho

6.2.1 G) Automated Invoicing System:

By using ERP solution an automatic Invoice has generated upon digitally receiving the bill.

Supplier mail his bill or Invoice to invoice@akij.net and system automatically identify the bill and check it using three way matching principle and proceed it for payment.

Figure: 55 Automated Invoicing System in ERP

AKIJ GROUP

Bill Registration

Print Copies:

Reference: PO Ref No.: 1267388 Go

Billing Unit: UDTCL Party Type:

Party Name:

Bill No.: Bill Date: 2021-Apr-06 Amount:

Remarks:

Save

☐ Advance

Total PO Amount:

Total Advance:

Ledger Balance:

Adjust Amount:

Search: Go

Party Ledger: Full Name of the Company: TRACE TI

BillCode:

Attach

Challan And MRR:

Challan	MRR	Amount	Remove

Pending Bill:

SLNo	Bill Reg Code	Bill Rcv Date	Party Name	Bill Amount	RePrint	SPrint

6.2.2 Automated Notifications System

Akij cement ERP solution provides automatic notification in all steps of operation. When anybody raises a Purchase Requisition or Purchase order or QC requirement or others an automatic mail notification has been sent to the pre-selected persons as per authority matrix.

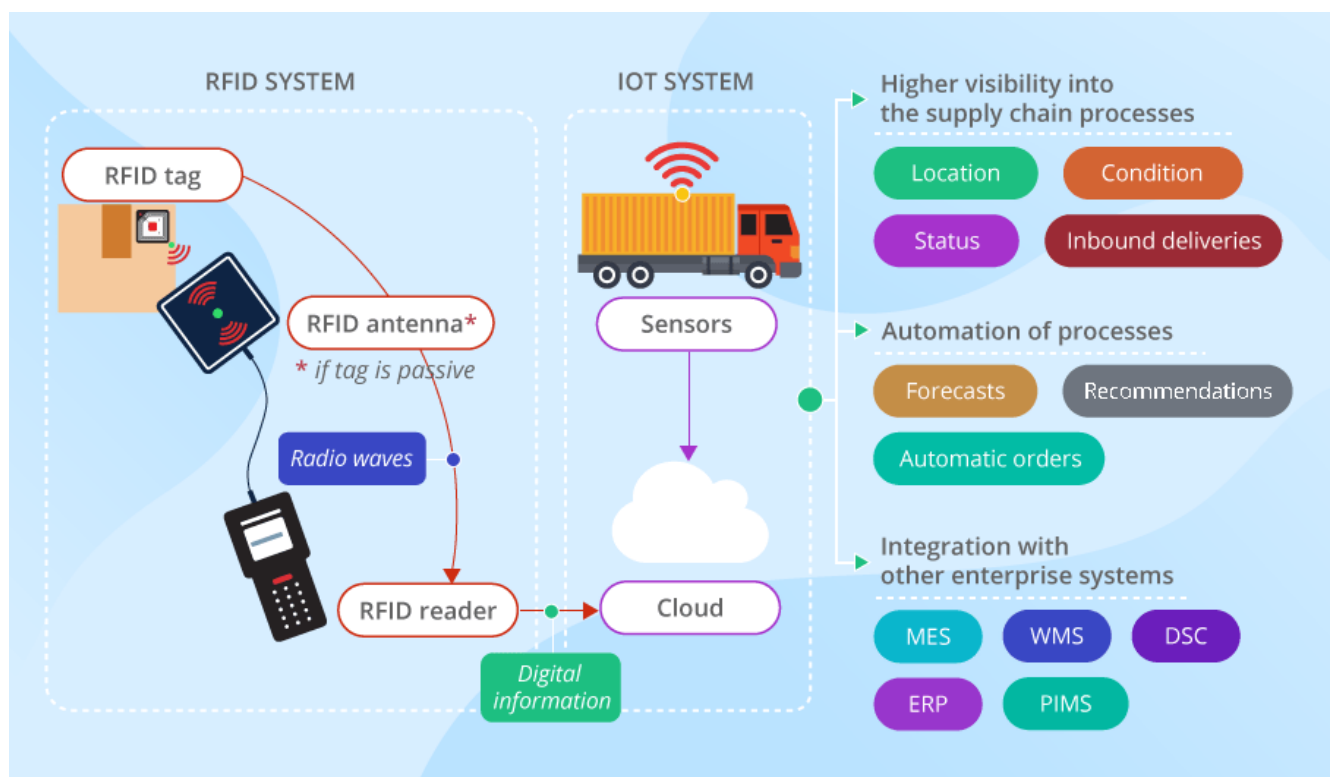
6.2.3 The Internet of Things- (IoT)

One of the key factors for digital twins is the rapid growth of the Internet of Things. Digital twins are made possible by IoT technologies as a combination of sensors and gateways is now technically and economically feasible to collect large volumes of data from a larger range of objects.

Akij cement IoT team has already developed datacenter temperature monitoring system, Logistics automatic tracking system using IoT, vehicles image processing and identification, Central Electricity controlling and motion detection which helps to reduces fixed cost and increase probability.

Anytime, anywhere information access empowers you to form knowing, intelligent selections and take corrective actions so that the supply chain runs additional swimmingly and with efficiency. IIoT square measure integrated with central enterprise systems (ERP).

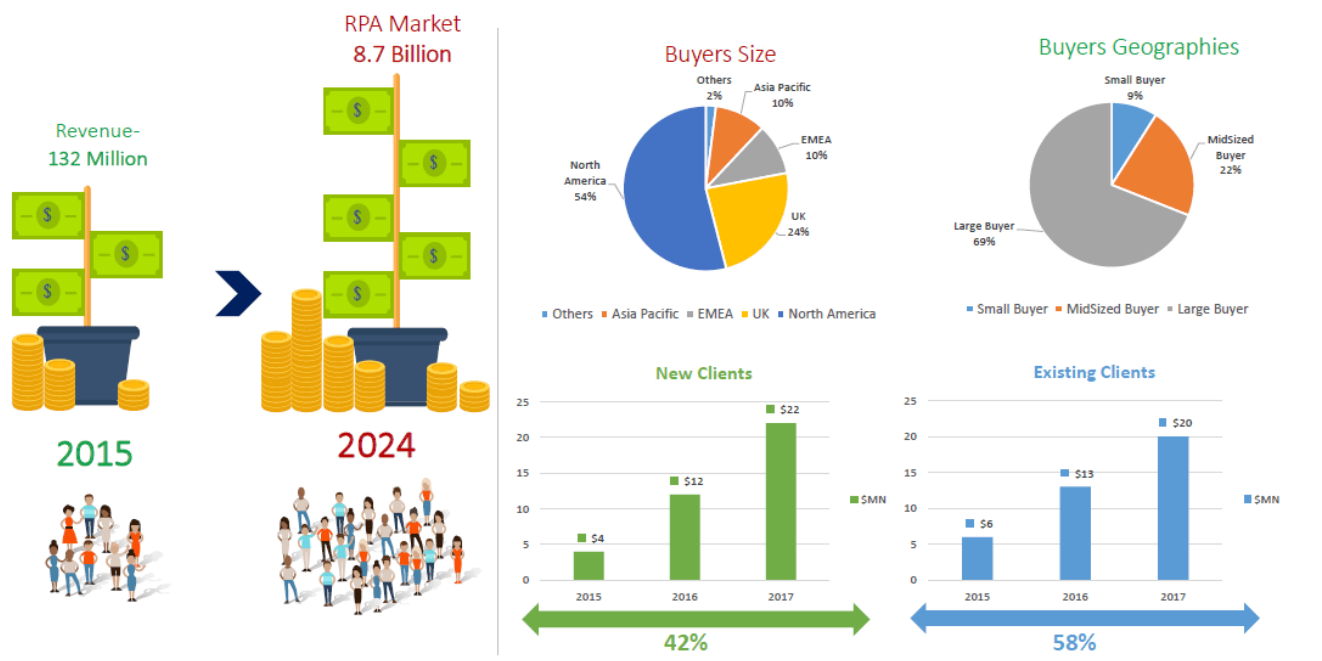
Figure- 56 IoT process Flow



6.2.4 Robotic Process Automation (RPA):

Robotic process automation (RPA) uses automated bot robot software to automate traditionally difficult to automate manual operations. A number of aspects of supply chain management are highly suited to RPA. This includes the management & ordering of customer relationships, supplier relationship management and acquisition, transport and logistics as well as supply and demand management. Akij Cement uses RPA for supplier delivery of material due date reminder automatically.

Figure- 57 RPA

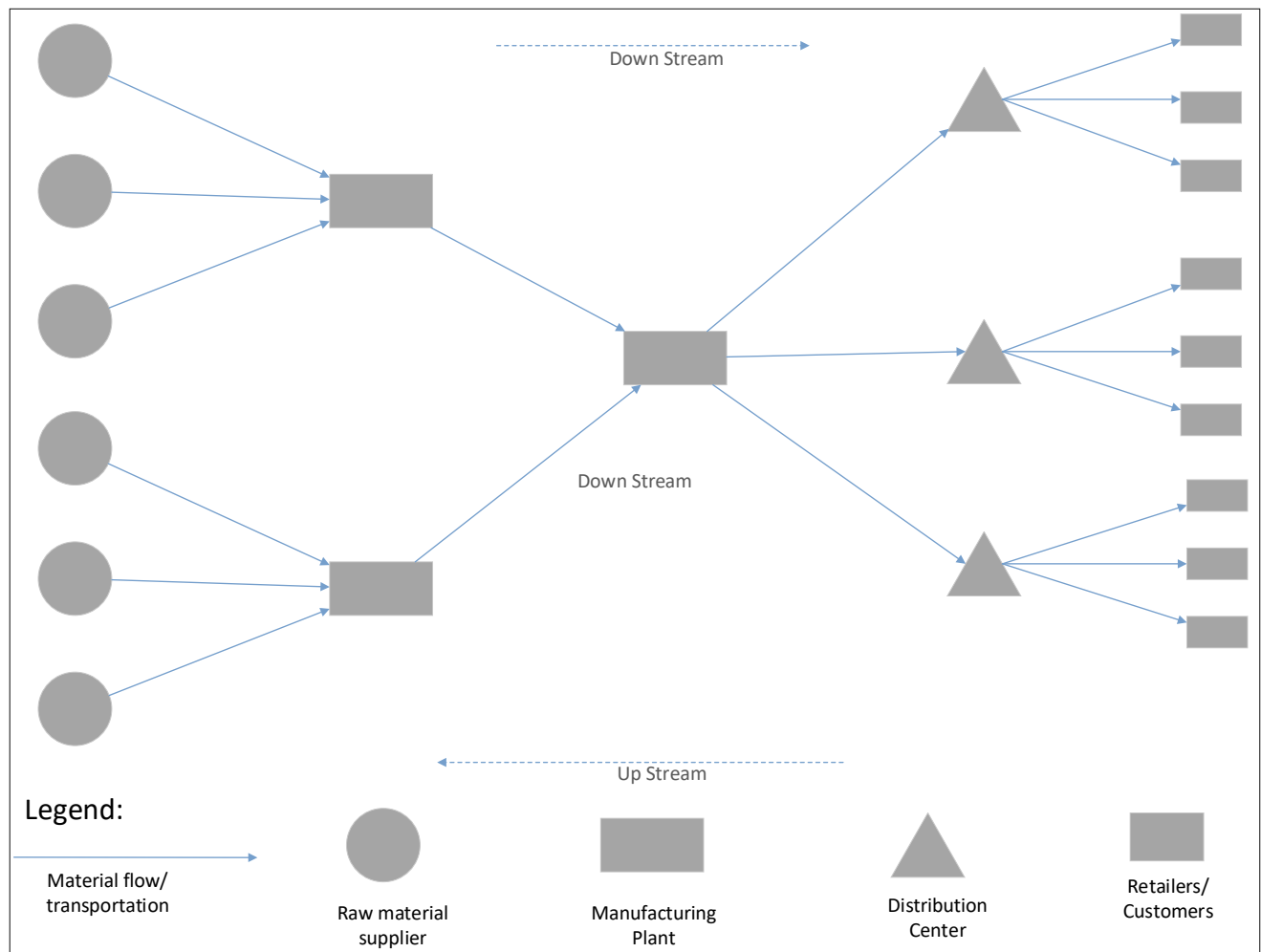


6.2.5 Cloud Computing

Cloud Computing optimizes the availability of the supply chain network, financial and operational advantages by offering infrastructure, platforms and system software solutions. Supply chain management generally involves supervising the transfer of goods and product, like from a provider or vendor, then to a manufacturer, a distributor, a retail merchant and eventually to the buyer. Cloud computing refers to the apply of employing a network of remote servers hosted on the e-commerce to store, manage data information, instead of a neighborhood server or a private laptop.

Akij cement are taking advantage of cloud computing in specific supply chain activities. There are sure activities that are most ordinarily centered on in supply chain. These activities embody prediction and designing, logistics, service and spare components management, further sourcing and acquiring. several of those activities are greatly improved by supply chain managers with the utilization of cloud computing. Akij cement uses Microsoft Azure cloud services and it includes High-performance infrastructure for cloud computing, data analytics & machine learning.

Figure: 58 Cloud Computing in Digital Supply Chain Management

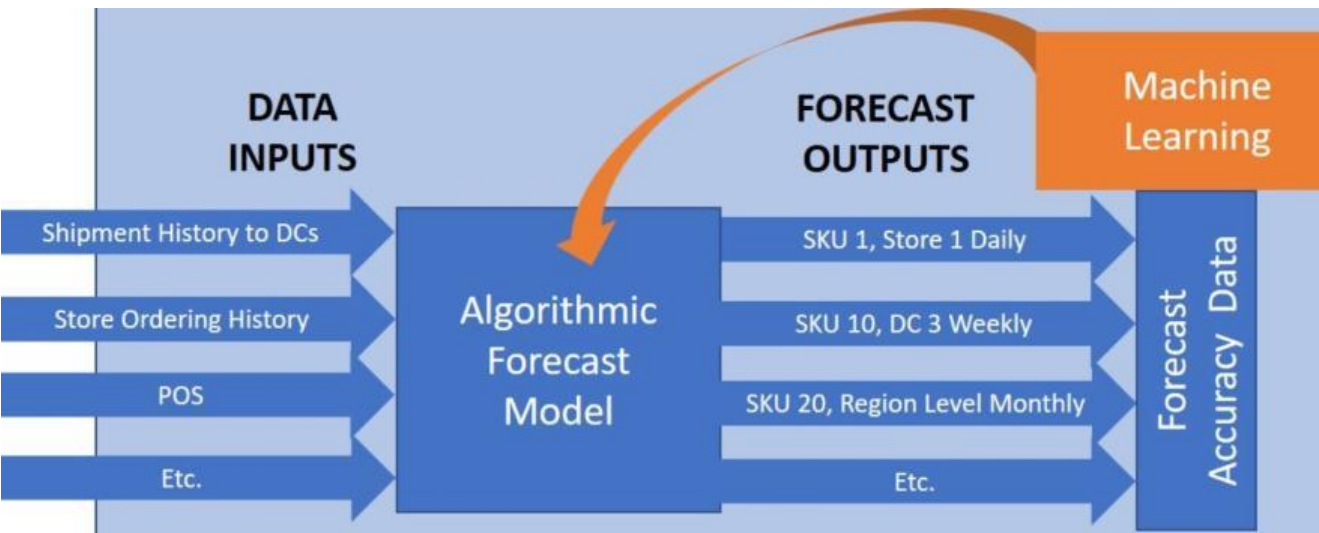


6.2.6 Artificial Intelligence (AI)

Machine learning frameworks area unit enables systems that will create selections autonomously further as predictions concerning future conditions supported historical and time period information. Akij Cement uses Artificial Intelligence as a per of digital transformation of Supply Chain.

In Akij Cement central warehouse AI uses in counting the Raw materials, spare parts, finish product by using High definition Camera and also use retail customer product counting purpose.

Figure- 59 AI Uses in Supply Chain digitization



AI has emerged as a hot topic in supply chain management to handle exactly this challenge. Innovative organizations applying AI and machine learning against large sets of supply chain data and information to unearth insights into issues and performance that is effectively and efficiently beyond the reach of even the most skilled planning professionals.

- In this age of technology Mobile become a emergency device for our everyday life. Akij cement has developed Smart Application (iApp) as a part of the digital transformation of Supply chain and it includes:

Sales Order created by field marketing using Apps and factory see the delivery requisition then create shipment automated selection of logistics , while vehicle goes for loading finish products a sensor has dictate the vehicle and apps shows which loading point is free. After loading a trip has started. After delivery Driver of the vehicle finish the trip and a automated code has sent to the customer.

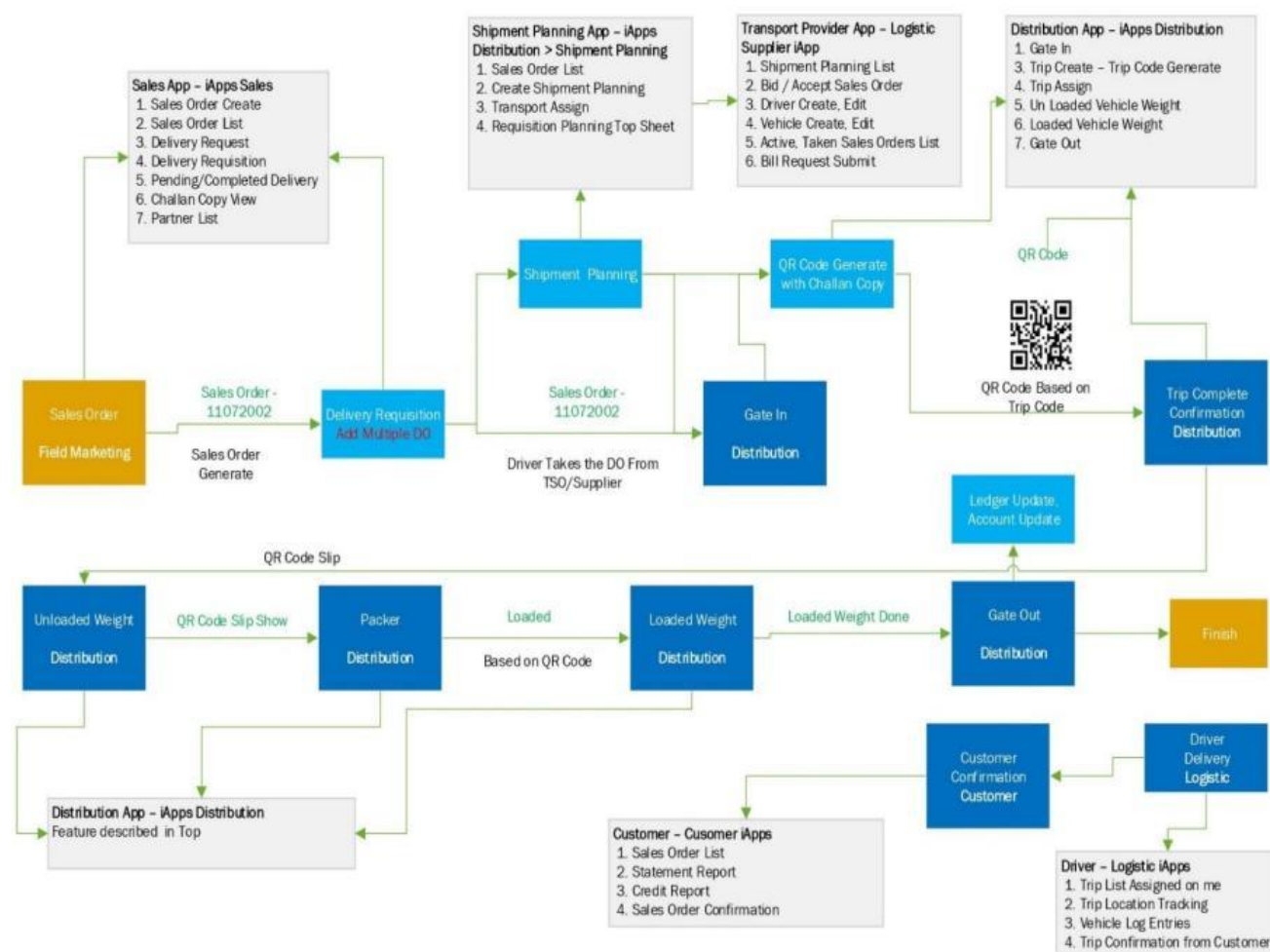
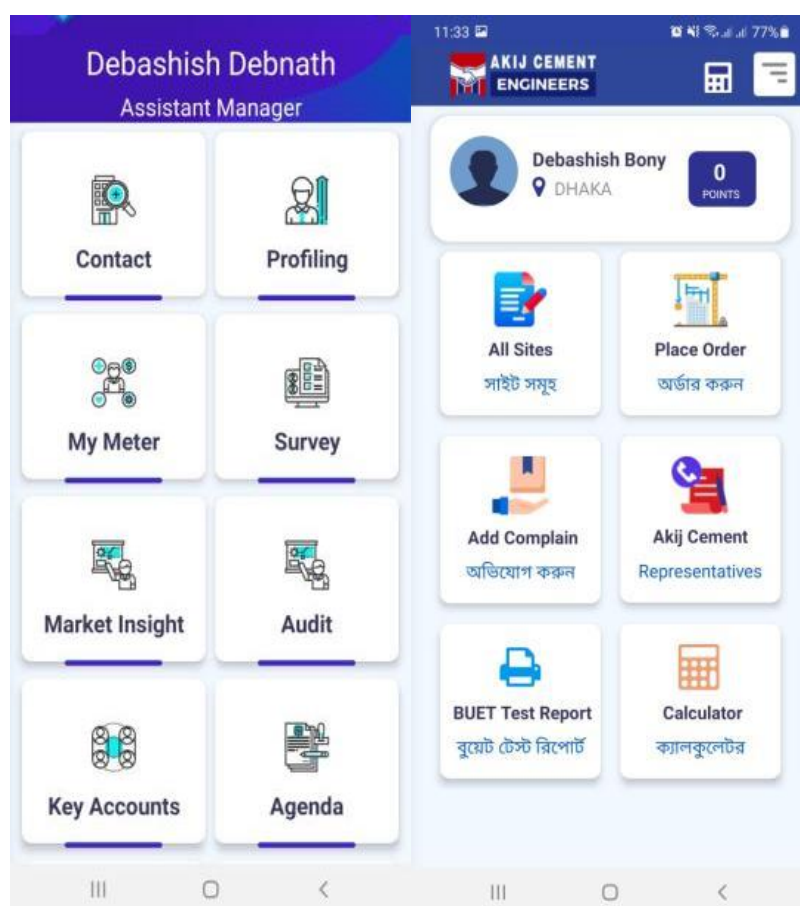
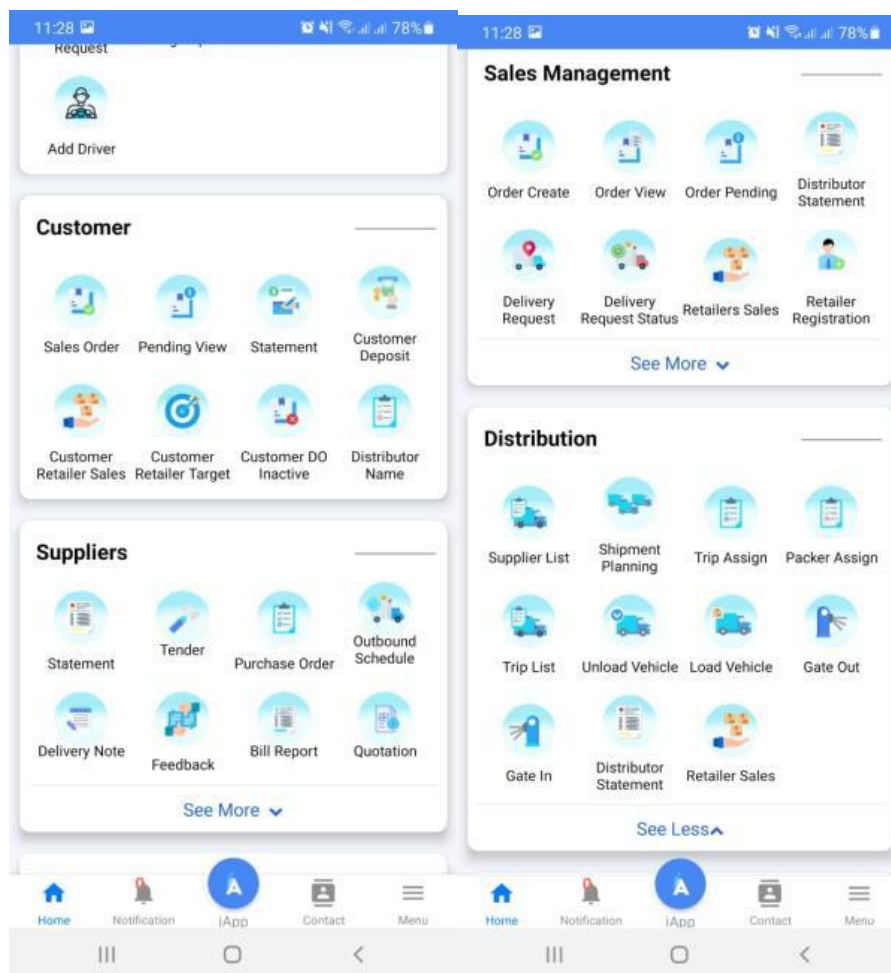


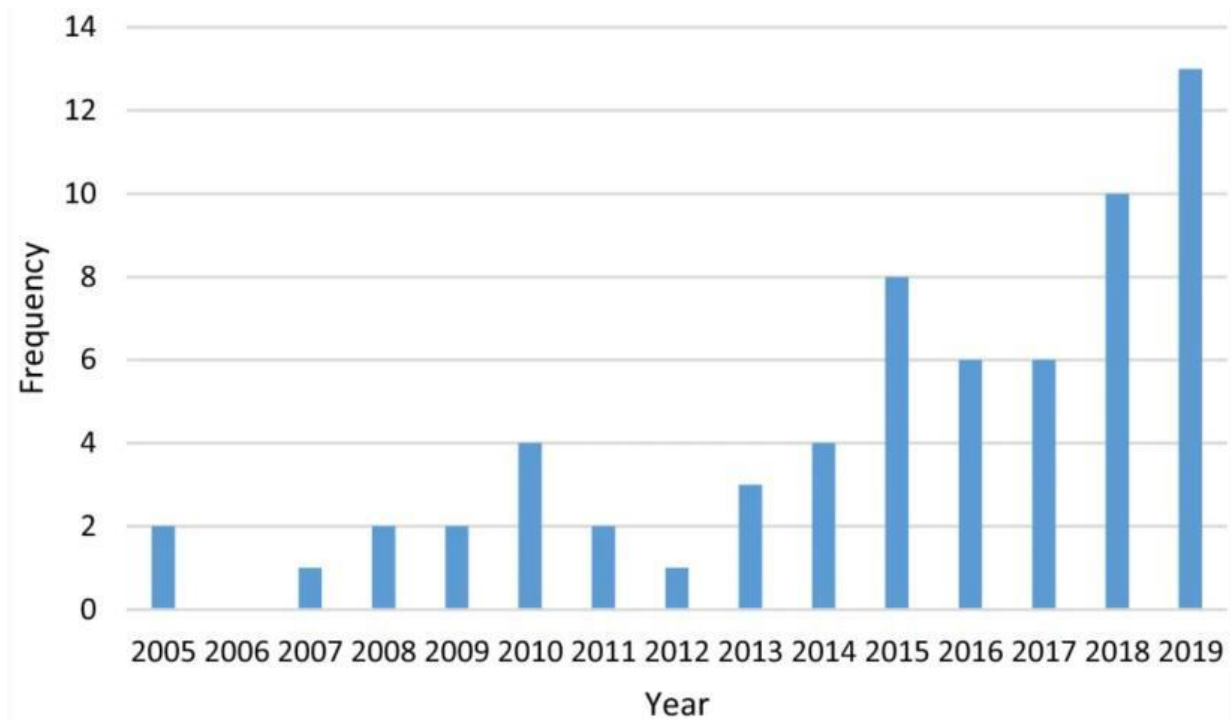
Figure: 61 Akij Cement iAPPs User Interface:



6.2.8 Advanced Business Analytics and Smart Reporting:

This information and data provide insights on client and supply chain activities. This helps to produce predictive insights on how and where the customer will buy and the likely future state of supply chain risks and opportunities rapidly.

Figure: 62 Demand forecasting



Akij cement uses smart business analytics and reporting for gaining competitive advantage and a better performance than its competitors.

Figure: 63 Forecast

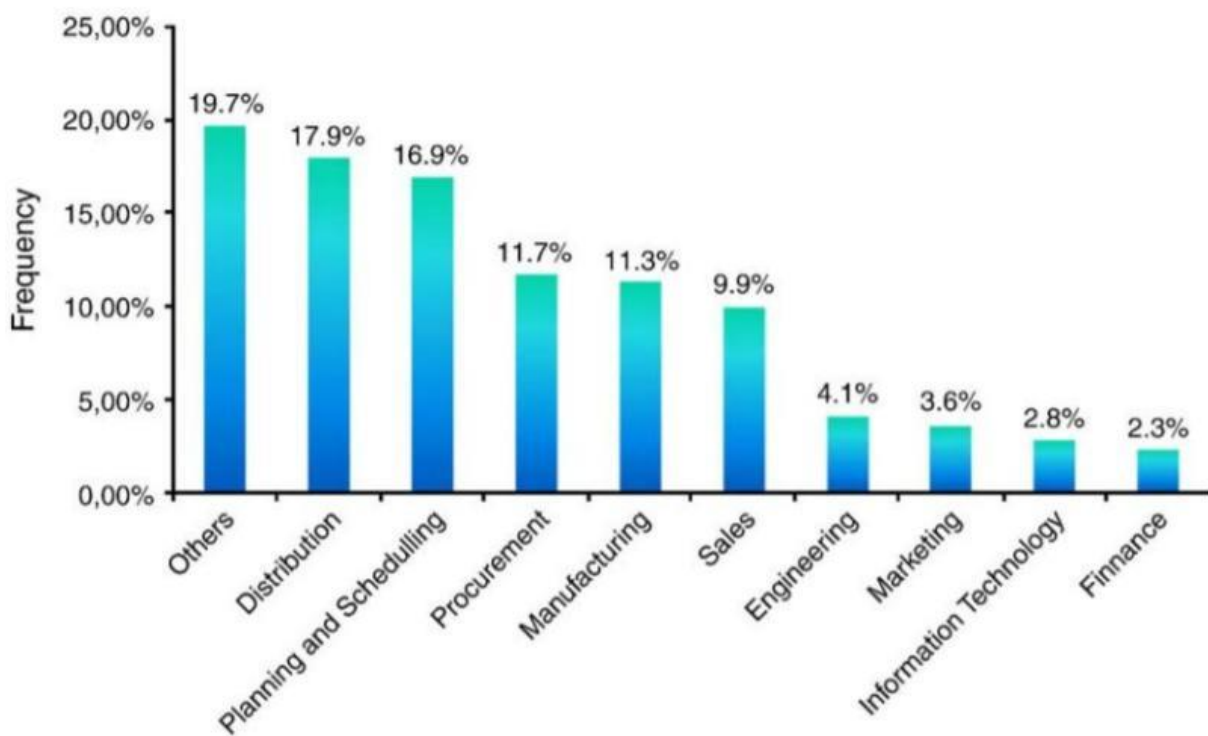


Figure- 64 Procurement Analytics Dashboard

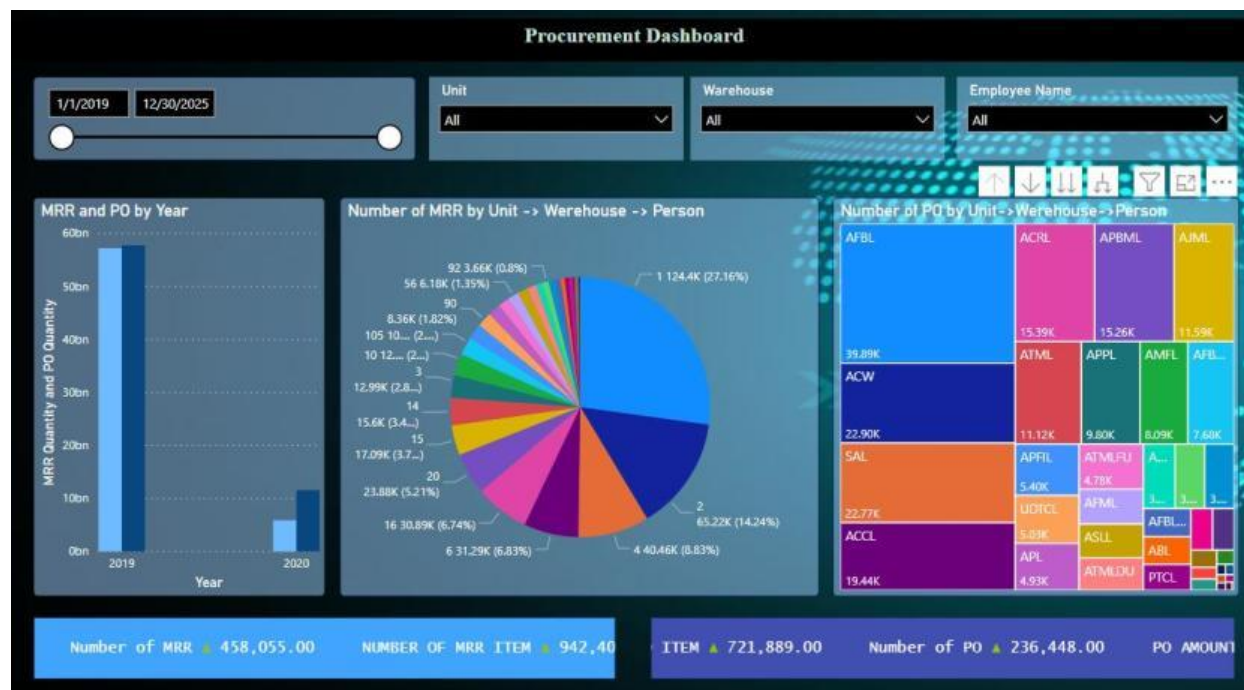
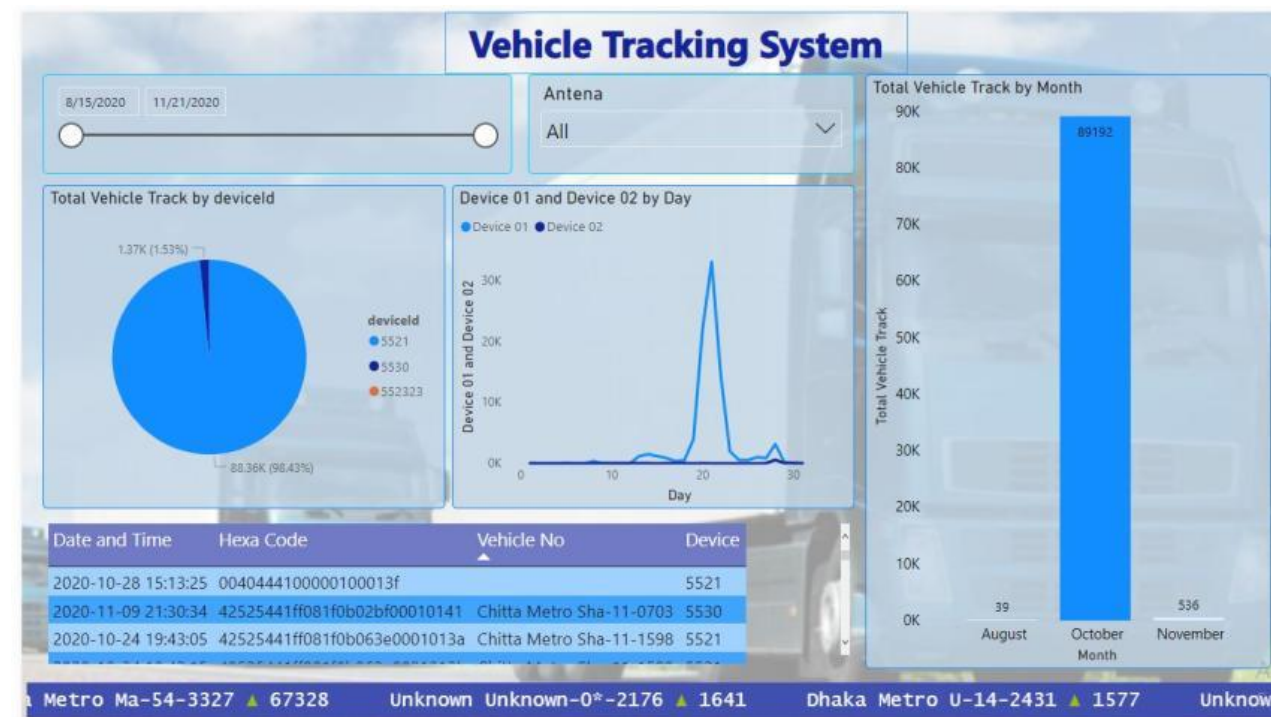


Figure- 65 Vehicle tracking system Dashboard



Here are six typical supply chain analytics uses in Akij Cement co. Ltd.:

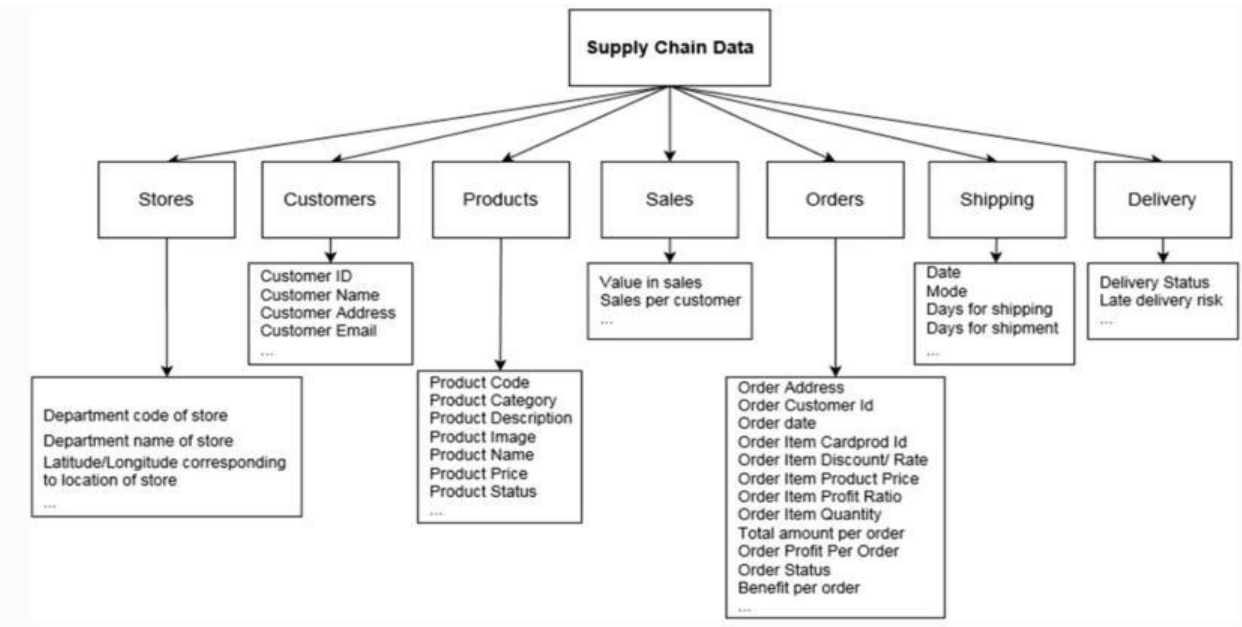
- Capacity management and planning
- Advanced S&OP.
- Simulation and scenario analysis
- Optimization
- Shaping of demand
- Supplier Analytics

6.2.9 Big Data:

Big data includes the voluminous data captured in real time due to identify the trends and insights. The automated networked landscape allows the capture of social, news, events, weather, and different signals in large quantities that are never seen or aggregate. Akij cement uses big data and using data warehouse for better data management and visualization.

For this Akij cement use HADOOP software library framework for manage massive amount of data and computation.

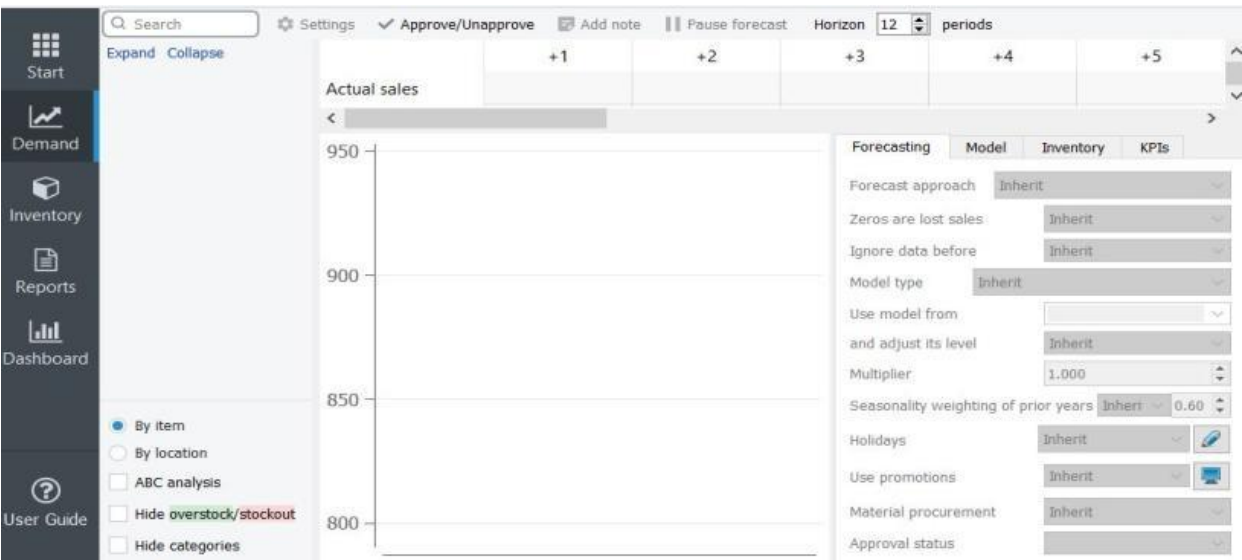
Figure- 66 Big Data in Digital Supply Chain



6.2.10 Advanced S&OP

Advanced sales and operation planning, often known as (I B P), is a most next generation sales and business planning (S&OP). Rather than the conventional S&OP, how production can be optimized, advanced S&OP looks at the financial results or cost of the company for determination of the most profitable scenarios for the production and the sales as well. Automated S&OP system are being developed by AKIJ Cement.

Figure:67 S&OP UI

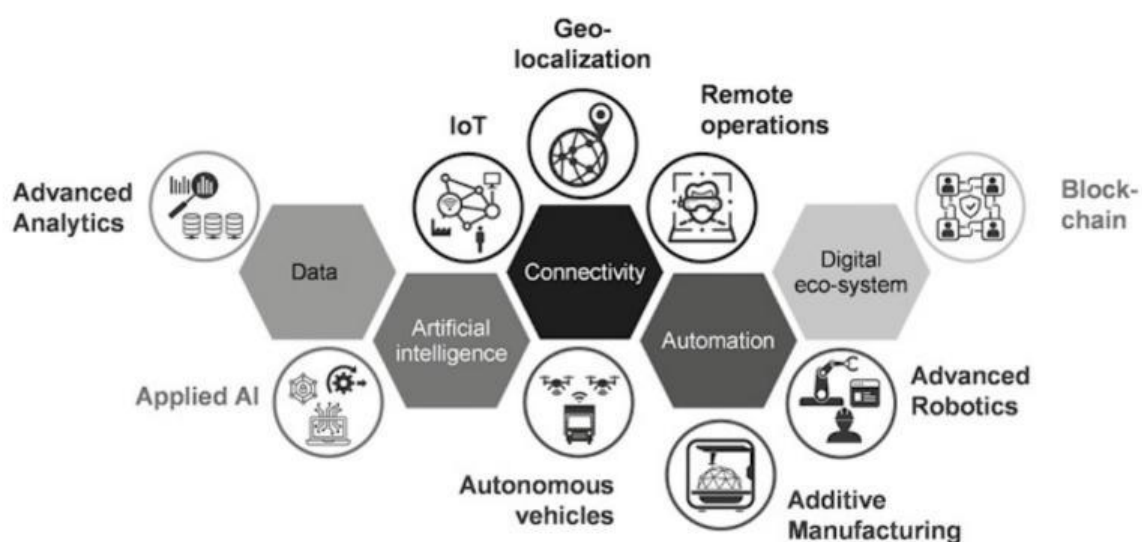


6.3 How Digitization Adding Value to Akij Cement Co. Ltd.:

For Akij Cement, digitization is an key factor. Modernizing and making use of the global digital transformation in Business-to-Business (B2B) as well as in Business-to-Consumer (B2C) and enhancing their performance across key operational areas, and generating new digital supply chain transformation for their clients, Akij Cement co. Ltd. adds the following values:

- A. **Focus customer attention:** Focus customer attention: The digital age has given customers a giant new world of products and services, a set of new tools they can use before procuring and analyzing and researching. Furthermore, online review aggregators, customer forums and even retail rating systems allow customers and others to make their voices heard.
- B. **Make customer involvement possible:** As technological developments have made the sharing of preferences and experience easier for customers, automated processes allow businesses to connect more meaningfully with customers.
- C. **Help to strengthen and expand the identity of the company:** The development of a professional website that looks modern is an integral part of building an effective online presence. Often this website is a pillar of digitization.
- D. **Provide better data management:** Digitalization also enhances business's ability to collect and analyze information concerning their operations and to enhance their business processes in addition to streamline myriad business and industrial processes. ERP data with tools, tools for customer relations (CRM), and even the combining of social media and e-commerce platforms offer fresh insights into the newly automated and digitalized companies' strengths and weaknesses.
- E. **Improved sharing and collaboration of information:** Enhanced coordination and communication is an area in which digital and automated technologies have important advantages and can play an essential role in translating them into automated systems and materials.
- F. **Optimization of existing processes:** the most obvious promise of digital disruption is that existing processes can be optimized through better data collection, data analysis and automated process control use.

Figure: 68 Digitization add values to supply chain



7.1 Introduction:

The traditional supply chain has a lesser hand in corporate policy during today's global competitiveness. Because the Supply Chain model is becoming a new notion of digitization. New technologies like RFID, ERP codes, GPS technology, etc. make it extremely easy, cost effective and efficient to manage the supply chain and to make it useful for Supply Chain management. All areas of supply chain management have been connected with digital technology. It significantly impacts supply chain management development and transitions from linear supply chains to digital platforms and ecosystems.

7.2 Lessons Learned from the Report:

My employment life and educational life program helped me understand the relation between the education life and the practical service. I gathered huge experience and compared my theoretical knowledge to practical implication. I came to know from my professional activity, how to make a good relation with the buyers, suppliers and other third parties in this trade. These following things I learned from developing this report:

7.3 Learning Organizations Culture:

Every organization has its own culture at the same time this practical organization have their own culture. Before starting employment, I did not have any idea about corporate culture. Within a very few days I can successfully cope up their culture. As well as I have learned to adapt into a new environment, working under pressure and working with different types of people. The report generates to meet the organization specific needs, also guides through the findings and the steps required for successful change management.

7.4 Gather Knowledge:

It is a big achievement for me to gathering knowledge through practical experience. From this study (MPSM) I gathered educational and side by side I also cross matched my work life which was a good experience for me. Not only that I also learned about different perspectives from this report.

7.5 Improved Time Management:

One of the good things that I have learned from the experience is time management. I badly needed to learn the time management because I had faced serious problems managing work and study. For example, while working in there I had to do work on priority basis. I had to make a list of work a week advance or more based on importance. This is highly increasing the efficiency and performance and reduces time wastage. Time management skills helped me a lot to cope up with big assignments and works.

7.6 Improved Communication Skill:

Effective communication skill in both written and spoken word is the most valuable transferable skills that employers seek. This report provides the opportunity to enhance this skill to the students. By this report, I met professionals from different total cultures and demographics. I had to step out my comfort zone to socialize with them.

7.7 Lessons Learned from the University's Report:

- Take on and apply new and improved skills.
- The communication of professional.
- It is important to ensure networking.
- A good approach to constructive critique.
- Difficult to work no matter what you do.
- Independence.
- The connections to Making.

7.8 Key Findings:

This report aimed to explore ways to improve the efficiency of the digitized supply chain, add value and customer focusing in a digitized supply chain. The objective was also to develop a conceptual framework for the evaluation and value-added evaluations of digital projects. The following are the conclusions to ensure that the purpose has been met:

- Simplification and standardization – the overall digitalization driver, which simplifies and standardizes all supply chain systems and processes.
- Management skill – the ability of a company to use scanning Backend integration – Integration of all processes, such as distribution, procurement, inventory not directly connected to the customer etc.
- Front end features – Customer-built integration of processes and the development of front-end applications that facilitate customer understanding.
- Supporting partners – increasing cooperation with suppliers and partners to create a supply chain which is more efficient and responsive.

The organization must use the opportunities offered by digital operations. Organizations should take advantage of the opportunities offered by digital operations. An organization's digital transformation should be implemented, the supply chains reconfigured and old, traditional geographical and functional silos overcome. The characteristics of a fully digitally transformed supply chain are extremely high levels of automated end-to-end operations, flexibility in business bundling and better visibility. Digitalization means that the application of the latest digital technologies is not necessary.

In order to better understand the untapped potential of existing resources and capacities at a better performance, it is more important to align automated and digital initiatives with supply chain goals.

7.9 Future Recommendations:

Here Future studies based on this report are presented with recommendations. Digitalization of supply chains was the focus of this study. Examples of research into this are:

- Examine how to use Big Data to predict organizations' ability to understand more thoroughly how they are digitally mature.
- Investigate how more specifically throughout the supply chain the five pillars of digitization can be employed.

This report focuses also on Digital Supply Chain Process, a large cement manufacturing company. Similar research into what the digitalization of supply chains in other industries adds value could therefore be interesting. In order to find similarities and differences between these companies, it might well be interesting to comparison smaller companies with large ones.

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Appendix

1.1 Interview questions:

Technological context

1. Have the company implemented digital platforms covering various businesses/silos? (Integration backend):

a. Are you using an organization-wide common ERP system?

b. Before the transformation, were there several different ERP systems on the chain, and there were many customizations that reduced efficiency?

c. If so, what was the amount of software adaptation prior to the transformation compared to after?

1. What benefits / performance improvements does this digital platform bring to the company? (For example, save costs, reduce manual processing, shorten delivery time, speed up orders to collect, increase efficiency due to better coordination, visibility, information exchange, etc.)
2. If these are two benefits, can you give a percentage of cost savings and a shorter delivery time?
3. Is the supply chain fully automated? (tender to invoice, Order to cash etc.)
4. If yes, what benefits are the result of automating the supply chain?
5. What effect has this transformation had on customer experience?
6. How well performing is the new digitalized supply chain?
7. Are you providing post-transformation product information and selling products to customers in other ways?
9. What advantages did these changes bring to the company?
10. Have the customer experience changed?
 - a. If yes, in what way?

Organizational Context:

11. Is it the organization, or is it the technology that controls how working within the organization, that sets the standard of how the technology and platform is designed?

12. Has the change in the organization caused changes and, if yes, what are those changes?

a. Do these changes have any advantages? (e.g. lower overhead costs, reduced handling, improved planning, etc.)

13. Has the transformation changed the way the organization works?

Environmental context:

14. Have these changes changed the way you collaborate with your suppliers along your supply chain?
15. What are the advantages for the company?
16. Is it easier to scale post-change supply chains to respond to changing circumstances?
17. Has the transformation changed Competitiveness?

1.2 Personal Interview with Employees:

1. Md. Abdullah Al Masud (Head of SCM)
2. Md. Mortuza Kasem(Head of Procurement)
3. Md. Asraf ud- douowla (Head of Logistic)
4. Md. Emran Hossain (Head OF Warehouse)
5. Md. Golam Kibria Konok (Head of ERP)
6. Md. Shariful Islam (Supply Chain)
7. Md. Saladuun (Supply Chain)
8. Mobasarul Alama (Foreign Procurement)