A STUDY ON PROCESS AUTOMATION AND LATEST TECHNOLOGICAL IMPLICATIONS FOR SUPPLY CHAIN MANAGEMENT

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Abstract: **The word logistics has its origin from Greek word "logistic" which means the art of calculating. However, the modern interpretation of the term logistics has its origin in the military, where it was used to describe the activities related to the procurement of ammunitions, and essential supplies for troops located at the front. Logistics not only includes activities related to the physical movements of the goods but also manages relationship with suppliers and customers. Anyway Logistic administration is a method whereby the necessities of clients are fulfilled through combination and coordination of the store network. The principle target of the paper is to decide the different innovation utilized in coordination and production network the executives including data innovation, correspondence innovation and programmed recognizable proof innovation. The paper additionally examines the effect of the innovation on coordination and inventory network the executives.**

Keywords: **Innovation, IoT, RFID.**

1. BACKGROUND OF THE STUDY

New technology is transforming daily business processes for many in supply chain management. The need for real-time tracking and accurate delivery systems makes supply chain management ripe for technological innovation — and mobile, wireless, handheld technology is leading the way throughout the logistics and transportation sectors.

With the ever-changing aspect of technology, keeping up with new capabilities and best practices can be difficult for large companies who have deep investments in older technology — it is a never-ending process. Although transitions take time, leveraging new technologies is key in this competitive industry.

The following are a few of the ways in which technology is transforming supply chain management:

1. Greater Efficiency and Transparency

Shippers are under pressure to reduce supply chain costs as part of greater company cost saving initiatives. Shippers want more services and better transparency from their supply chain managers, ideally without driving up costs. Since the start of the wireless era, many third-party logistics providers (3PLs) and supply chain managers have turned to wireless technologies and cloud computing to automate systems and improve accuracy.

Not only are automated systems faster and more efficient than their manual, fax- based predecessors, the mobile and automated methodologies also provide better data-capture, which can, in and of themselves, improve processes and can also be stored and analyzed to target areas for improvement.

2. Focus on Individual Employees

Smartphone technology offers shippers and vendors the abilities to pair workers with the devices most appropriate for their daily work. As mobile devices become more diverse and varied, companies are striving to match the job with the right device. While smart phones are gaining precedence in supply chain operations, they are still subject to the wear and tear. However, ruggedized cases have increased reliability for handheld devices to withstand daily outdoor usage. Today many asset- lite carriers leverage smart phone technology. Using apps, proprietary programs and mobile interfaces, smart phone technology uses the pings from that smart phone that's sitting with the driver and create a breadcrumb trail of how freight is being tracked. Also, applications on the backend enable a driver to signature capture information and create a proof of delivery. Smartphone's give an open network of carriers the ability to act like a closed-fleet network.

3. Tighter Communication and Community

Smoother and more frequent communication undoubtedly makes business operations easier. Mobile technologies and real-time communicating can create a greater sense of unity and development from those out in the field to those in corporate headquarters. Managers are often on the move, but improved communication and access to live information can make managers more in tune with daily happenings in the supply chain. Greater collaboration and communication ultimately boils down to better customer service. Communication aids in product tracking and delivery, which results in higher customer satisfaction with the supply chain process. When employees are connected through many stages of the supply chain, workers likely feel more fulfilled and operations often run more smoothly.

4. Making Way for Small but Nimble Carriers

Smaller firms with less investment in their current system have and will continue to find it easier to successfully integrate new technologies. Smaller fleets don't have to spend thousands on mobile resource management or automatic vehicle location systems anymore. Often, the job can be done with a relatively affordable mobile device or non-proprietary app, making the leap to wireless much easier. This flexibility may continue to give smaller carriers an edge, making them more agile and flexible in a competitive environment.

5. Government Requirements Tackled with New Technology

As of December 2017, the Department of Transportation requires Electronic Logging Devices for drivers and fleets. (Some companies, converting from the grandfathered AOBRD to ELD, must meet the December 2019 deadline. All others were required to move to ELD December of 2017.) Fleets faced with stricter regulations are turning to better routing software and logistics management technology to save time and money. As the government looks towards technological solutions, supply chain managers will have no other choice but to do so as well.

6. Internet-of-Things and Vehicle-to-Everything changes

The Internet of Things and Vehicle-to-Everything (technology to connect the vehicle to other vehicles, the cloud and anything else) could work together to go far beyond ELDs. These networks of technology could improve safety in numerous ways, monitor drivers' health, assist with lane changes and more as information is passed between a vehicle and an entity on the road a traffic light, crosswalk or other signs.

More specific forms of this technology include connecting Vehicle-to-Cloud (V2C), Vehicle-to-Pedestrian (V2P) and Vehicle-to-Grid (V2G). These technologies could improve safety on the road as well as driving efficiency.

2. INTRODUCTION

Inventory Network Management (SCM) is the administration of a system of interconnected organizations associated with a definitive arrangement of the item and administration bundles required by end clients (Harland, 1996). The sharing of data among production network systems permits the store network drivers to cooperate with the objective of incorporated and facilitated supply chains for successful inventory network the executives. Data additionally upgrade the execution and lessens the dangers of supply chains since it gives forms executed exchanges and it makes an open door for chiefs when they need it and in the organization they need it. This is the place IT comes into the job and it comprises of equipment and programming applications.

IT additionally assumes a significant job in incorporating providers, fabricates, wholesalers and clients to fulfill the amount and nature of items. Associations can assemble imperative data along with the whole production network and respond rapidly to any anticipated market changes, accordingly increasing the upper hand by adequately using SCM (Tummala and Schoenherr, 2008). Giving data accessibility and permeability, empowering a solitary purpose of contact for information, permitting choices dependent on complete production network data and empowering joint effort with accomplices are the goals of IT in SCM (Simchi-Levi et al., 2003). The practical jobs of IT in SCM have been sketched out as Transaction Execution, Collaboration and Coordination and Decision Support (Auramo et al., 2005).

IT frameworks, for example, information trustworthiness, ongoing accessibility, permeability and handling ability of data and institutionalization of business process are relied upon to encourage better coordinating of free market activity between production network individuals and make a magnificent background for leaving on mix with outside accomplices in the inventory network (Tarn et al., 2002). Through the utilization of data innovation in-store network is additionally producing the possibility of digital wrongdoing as "PC helped, for example, hacking, phishing and "PC centered" as abhor violations, telemarketing/web extortion wrongdoings.

Technology is a means to enhance business competitiveness and performance. It plays a major role in success of supply chain by enhancing the overall effectiveness and efficiency of the logistics system. In logistics many new technologies are used in developed country while in India adoption process is very slow. However due to liberalization of the Indian economy the competitive pressure is building up and the only option to face the competition in to go in for technology enabled operations.

The latest technologies being used in "logistics and supply chain management" are segregated into

- Automatic Identification Technology

- Communication Technology

- Information Technology

Programmed Identification Technology Automatic Identification (Auto-ID) is the term used to portray the immediate section of information or data in the PC framework, programmable rationale controllers or any microchip controlled gadget without working a console. These technologies include Bar Coding, Radio Frequency Identification (RFID) and Voice Recognition. Auto ID can be used for tracking the containers, packages, cartons or a truck carrying the goods on time bound dispatches to the customers.

The benefits of Auto ID include accuracy, cost saving, speed and convenience of data storage and processing of information. The significant Automatic Identification technologies in use are:-

Bar coding- Bar coding is a sequence of parallel lines of different thickness with spaces in between. These bars are nothing but the items of information in the codified form, which can be read with the help of a scanner.

Impact of Bar code technology on operations of "logistics and supply chain management in-

- Procurement operation

- Processing

- Production operation

- Distribution operation

Radio Frequency Identification (RFID) – "RFID" is an Automation Identification and Data Capture (AIDC) innovation. RFID first showed up in following and access applications amid 1980. RFID-based frameworks take into account non-contact perusing and are viable in assembling and another unfriendly condition where scanner tags couldn't endure.

RFTs- Radio Frequency Tags (RFTs) are a piece of silicon chip to store data in the microcircuit. The RFTs are programmable with erasable memory. Data is stored in coded form and communicated to the reader through waves. The basic principle of tag is that antenna emits the radio signals.

Electronic Data Interchange (EDI) - EDI technology is used for transfer of firms documents from one computer to another computer. With EDI the business documents such as invoices, cheques, and challans are sent electronically from one organization to another.

Integrated Supply ChainPerformance Measurement

Using Web 2.0 technologies, every order or transaction can be traced in a Digital Operating Model. Tagging technologies such as barcodes or RFID provide real-time data feeds for physical movements. Virtualized data centers make available information that was concealed, until now, by processing and storing data for multi- function and multiplication supply chains. Combining this operational data with financial information, along with data from external sources like market data or benchmark information, can help in better decision making compared to the reporting techniques often usedtoday.

Supply Chain Technology Architecture and Infrastructure

Innovation engineering is the structure rationale for business procedures and IT foundation and mirrors the reconciliation and institutionalization prerequisites of the association's working model. Though many technology requirements may already be in place, the challenge is to select and implement digital technologies and integrated platforms that employ reusable and exchangeable components with minimal investment in time andeffort.

Walmart's extensive use of technologies such as demand pattern analysis, RFID, wireless tracking devices, warehouse labor management systems, vehicle management systems, and voice-directed picking devices for continuous improvement in its supply chain. If an organization aims to successfully implement a transformation program, it will have to address all the five dimensions discussed above in a consistent and well thought out manner.

Supply chain: -

Supply chain is a series of business processes in which products or services are produced and delivered to customers through value adding activities implemented by involved parties. In a manufacturing supply chain, the value adding activities mainly include product development, product design, raw materials supply, manufacturing the product, product packaging, delivery to customers, and post-sale services.

Supply chain management for a manufacturing company refers to incorporating its manufacturing process to all value-adding activities implemented by parties who add values to its final products. The term, supply chain, is a simplified description for vertically related business processes. Nowadays, it is more frequently referred as supply networks or supply chain networks because a company is likely to be involved in more than one supply chain and the related companies form business networks. Since IT became catalyst of improving business processes, "Supply Chain management" has gained tremendous benefits from applying ICT to various aspects of its tasks. IT application moves from data management to control automation, and then moves to enterprise integration.

Supply chains have advanced the last two decades with improved efficiency, agility and accuracy. However, it was only at the time when the Internet technology became a practical means of information exchange in industries, that supply chain management started changing its way of allocating and controlling resources across organization boundaries.

Principles of e-supply chain management

The fundamental challenge for "Supply Chain Management" is how to efficiently integrate and optimize supply chain operations with dispersed marketplaces and characteristic demands using the latest advances in information technology. E-Business using Internet technology to facilitate information exchange and communication in business networks has emerged as an innovative approach further exploring value-adding opportunities in supply chains. The e-business approach plans and executes front-end and back-end operations in a supply chain using Web-based applications. Incorporating e-business approach in supply chain management has been proved as a competitive method for increasing values to be added and improving process visibility, agility, speed, efficiency, and customer satisfaction.

E-Supply chain refers to the business activities that incorporate e-business approaches into supply chain processes. "e-Supply chain management" involves applying e-business technologies to assist and optimize value-adding activities in supply chains. A more detailed definition of "e-supply chain management" can be found in the description of Norris et al.: "Electronic supply chain management (e- SCM) is the collaborative use of technology to enhance business-to-business

processes and improve speed, real-time control, and customer satisfaction. Not about technology change alone, e-SCM is about culture change and changes in management policy, performance metrics, business processes, and organizational structures across the supply chain."

A key feature of e-business equipped "supply chain management" is network centric. This focuses on connectivity, co-operation, and co-ordination and information transparency. Networked supply chain partners share some knowledge, information, and other required resources. The networked relationships change the traditional supply chain information flows from linear transmission to end-to end connections, i.e. information can be transferred directly from any partner of the supply chain to This networked information transfer provides transparent customer demand information to any part of the supply chains.

3. LITERATURE REVIEW

Barney Amit And Schoemaker .The Resource- Based View Of The Firm And Its Application. Defined Firm Resources As All Assets, Capabilities, Organizational Processes, Information And Knowledge Assets And Capabilities That Are Available And Useful In Detecting And Responding To Market Opportunities Or Threats. The research objective is Value, Rareness, and Inimitability Non- Substitutability. **Ravichandr an & Lertowngsa tien Rai Et Al.Sambamurthy (2006),** Frame work analysis. Generated Increased Business Volume And Above Average Profits, Thus Becoming Direct Contributors Of Competitive Advantage. **Mabert & Venkataramna (1998),** The Concept Of Supply Chains Is Not Consistently Interpreted By All Relationship Between A Firm Value Chain and Facing Challenges Managers Researcher Functional Activities. **Straub & Patnayakuni (2006),** Perspective Partnership Instead Purchase Highly Customized Products Studies Suggest That Operational And Strategic Gains. Chain Are Possible When Trading Partners Are Willing To Make Relation- Specific Investments And Combine Resources In Unique Ways. Therefore, There Is A Great Opportunity For Is Research To Study The Ios Capabilities That Are Important For Creating Relational Value In Supply Chains. **Eunni et al Lorenzoni and Gunasekara & Ngai (2007),** Management in Supply Chains. Disintegrated mode of governance knowledge transfer and knowledge creation and conclude that the literature on KM in international alliances emphasizes three distinct processes of inter- organizational learning: transfer of knowledge between the firms, creation of new knowledge through transformation of resources contributed by the firms, and application of the new knowledge to improve the existing partnership.

STATEMENT OF THE PROBLEM

Despite of the attempts and the research work by the robot researchers to emulate human intelligence and appearance, the result is not achieved. Most robots still cannot see and are not versatile object is not properly recognized by it. For the effective and proper mechanism of robotics technology it is important to prioritize the inefficiency associated in it. Though the wide use of robotics technology will take away many jobs of human being and it will create unemployment in the society.

The use of robots in performing various jobs will lead in the reduction of jobs of the human being so the initiation should be done systematically. The developments of robots will lessen many high-end precision jobs and will help in various sectors like agriculture, military, health and so on. This will lead to robots as a helper in the workplace with some degree of balance between the actual requirement and the greed.

The society should support and care for the developments in the robotics technology as this will be beneficial for the people and the various sectors of an economy. Many tasks which are beyond the human ability can be performed with the help of robotics and robotics in the war will be very helpful in its operation. The advancement of robot technology will be amazing and today, robots can be seen virtually in all the fields from transport to health, and recreations to industries. The use of this technology will get proclamations from the society for taking away the jobs of ordinary man. But to solve the issues related to this the usage of robots should be applied to selected tasks and mostly be used in the areas where human cannot reach or is not capable of performing.

OBJECTIVES OF THE STUDY

There are many researches about the evolution of the technology within the industry and how is the new concept of "smart factory" which is called "Industry 4.0". However, the concept of this development applied to logistics processes within the manufacturing, is still a non-spread topic. Therefore, the aim of this thesis is to talk about the evolution of logistics systems and towards this evolution is moving nowadays.

The Objectives of this Dissertation are:

1. To give a brief perspective of what Industry 4.0 is

2. To make a framework of Logistics 4.0

3. To explain the state of the art of Logistics 4.0 and towards this concept is moving

4. To give actual examples of the technology of Logistics 4.0

5. To make an implementation in the Lab of RFID technology which is an essential part of the Technology applied for the development of Logistics 4.0

6. To explain a real implementation of the latest and greatest tech, which meets some of the Concepts of "Logistics 4.0??"

IoT enables to share information in real-time and to storage big amount of data in order to have access whenever and wherever is wanted, although it is essential a good security software in order to protect all this information. Therefore, by the use of Internet, a network can be created which connects factories and people as well as machines with each other, making a faster and more optimized logistics processes. systems, which collect and analyses data and Hence, my main motivation is to finish my bachelor's study knowing what can be understood nowadays as smart technology in logistics. As well as read and know about the actual logistics scenario and towards this scenario is moving, writing about:

1. How logistics have changed overtime?

2. How the IoT is being implemented for supply chain management?

3. How IoT and the RFID systems can change the actual logistics scenario?

RESEARCH PROBLEMS & GAPS

The main challenge writing this synopsis has been the lack of information, since Logistics 4.0 and Process Automation holds the future of this industry. This is not some tech which has been tried and tested and is at the maturity state, it has just begun. It is easy to find information about Industry 4.0 and its components but it is not easy to find this information focused in the logistics segment.

Furthermore, I have found a challenge in the fact that logistics is a broad term that encompasses many different processes, therefore it has been a challenge to include the right contents in order to give a clear understanding of the new evolution in logistics and make a proper framework of it. My main contribution in this paper will be a framework of the industry 4.0 and how the way of working and methodology has changed with the implementation of these new techs - like: Robotic Process Automation and how the use of the Internet of Things (IoT) and Radio Frequency Identification (RFID) systems can trigger an evolution of the actual logistics.

This paper has appeared flow status of SCM and coordination examine from point of view of research strategies, information investigation methods, information sources, and the dimension of examination. It has appeared present research is more thorough than the past research. Thoroughness suggests care in dodging arbitrarily finishing up something the exploration did not really uncover. It implies that examination ought to speak to the real world and yield ought to be relevant, all things considered issues. At that point just the examination network can really bolster and legitimize the cases it makes.

RESEARCH QUESTIONS: -

To investigate the dynamic roadmap for successful implementation of Process Automation and what factors can cause failure when implementing Process Automation and supply chain management, the research questions are the following:

- How to successfully implement a Process Automation and supply chain management in companies?

- What is about the Process Automation and supply chain management?

- What factors can cause failure when implementing the Process Automation?

- What factors are common for Process Automation and supply chain management project evaluation?

It is interesting to investigate how to implement Process Automation and supply chain management successfully for many reasons.

First, RPA is relatively new and there is little prior research on RPA implementation. Second, the researcher believes that RPA will have a high impact on the Icelandic labor market in the next few years and finally, the researcher thinks RPA is an interesting tool to help companies to increase efficiency.
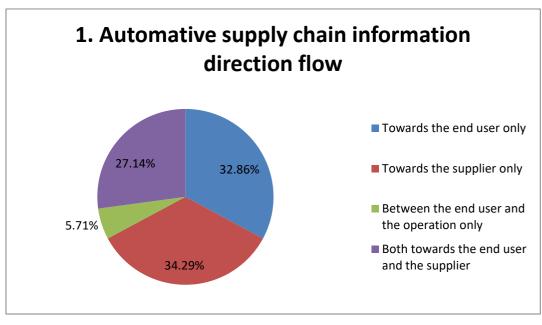
4. RESEARCH METHODOLOGY

This study implements a survey methodology. The unit of analysis is a dyadic SC relationship between a supplier firm and a customer firm. The proposed constructs were measured at the SC dyad level from supply chain partners" perspective. The approach of collecting SC level data has been adopted by a number of studies that focus on the impact of SC strategies or SC information systems on SC performance (Malhotra et al. 2005; Monczka et al. 1998; Narasimhan and Jayaram 1998; Tan et al. 1999).

The sampling frame of the survey included those supply chain professionals who have direct responsibility for and knowledge about the SC function in their firms, and are involved in one of two professional organizations (ISM and APICS) in the supply chain industry. This section describes the methodology and the development of measures for the empirical study. Specifically, three key areas are discussed: instrument development, operationalization of the constructs, and sample.

RESEARCH DESIGN

- Explorative data collection: primarydata

- Data collection tool: survey method andquestionnaire

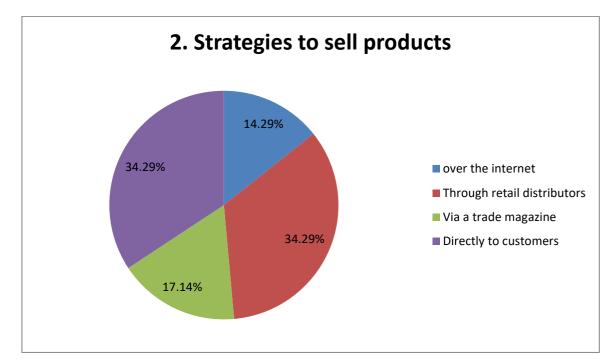- Sampling: supply chain executives.

- Sampling method: stratifiedsampling

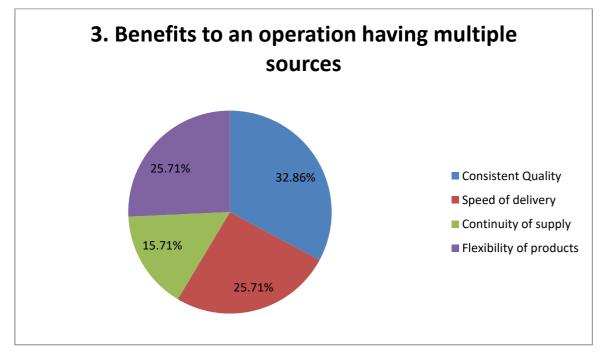## 5. DATA ANALYSIS

Interpretation:

Out of 100 respondent, above response had shown as result that 32.86% of the towards the end user only , 34.29% towards the supplier only, 5.71% as between the end user and the operation only and 27.14% as as shown the supply chain information direction flow.
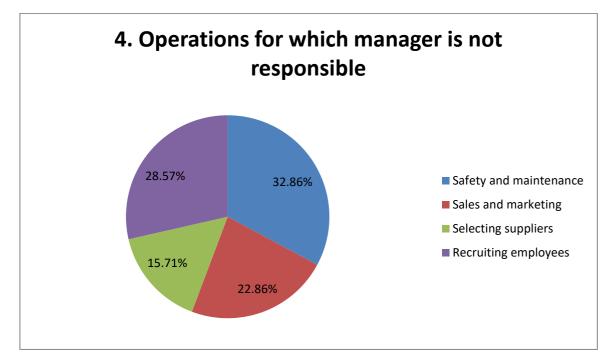
2. Strategies to sell products

Interpretation:

Out of 100 respondent, above reaction had appeared as result that 14.29% of the Over the internet, 34.29 Through retail distributers, 17.14% Via a trade magazine and 34.29% Directly to customers, The proportion demonstrate the automotive companies, Who mainly sell their new products.
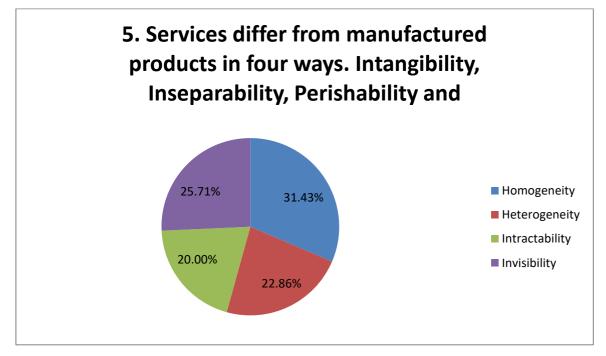

3. Benefits to an operation having multiple sources

Interpretation:

Out of 100 respondent, above reaction had appeared as result that 32.86% of the Consistent quality, 25.71% Speed of delivery, 15.71% as Continuity of supply and 25.71% Flexibility of products, given apportion the main benefit to an operation of having multiple sourcing.

4. Operations for which manager is not responsible

Interpretation:

Out of 100 respondent, the above response had shown as result that 32.86% of the Safety and maintenance, 22.86% Sales and marketing condition, 15.71% as Selecting suppliers and 28.57% as Recruiting employees of an operations manager not be responsible for.

5. Services differ from manufactured products in four ways. Intangibility, Inseparability, Perishability and

Interpretation:

Out of 100 respondent, above response had shown as result that 31.43% of the homogeneity, 22.86% heterogeneity, 20% as intractability and 25.71% as invisibility. The ratio of the services differ from manufactured products in four ways, Intangibility, Inseparability, Perishability and Intractability.

6. CONCLUSION

Effective material and production network the executives is vital for the accomplishment of any little scale producing and creative venture and can be the central factor between a fruitful undertaking and a task loaded with deferrals and cases. Better material administration strategies and choice models are expected to improve the electrical business flow rehearses, in this manner expanding the effectiveness and limiting expenses. A successful supply the executive's framework is fundamental for overseeing proficient material administration to stay away from material deficiencies, scatterings, misfortune, and burglary which may result in increments in group inactive occasions, loss of profitability and postponement of exercises. Little-scale Electrical industry should actualize a proficient material administration framework because of the way that in the vast majority of the cases they are approached to crush their offers so as to hold the expenses of venture under spending plan. In such a case, disappointments to successfully oversee materials could result in declines in benefit or even misfortune.

The essential objective is to have the material required, in the sums required, with the quality required, and the time that they are required. Most electrical organizations have a material administration framework that serves their 205 needs, in spite of the fact that it could be improved. Institutionalization of the material administration framework could be a stage forward in improving the framework and taking out a portion of the bottlenecks. The exploration displayed in this record went for planning an incorporated arrangement of choice help apparatuses for material obtainment for the little scale industry especially an electrical industry. An integrated approach for material procurement provides better decisions on what to order, how much to order and where to deliver. Future research will be needed to develop a more complete framework integrating other decisions needed in areas such as supplier selection and preliminary material scheduling during the prefabrication phase. A fully integrated approach will better improve communication and minimize gaps in information flow among all the parties and departments involved.

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