

# Examining the Practices of Supply Chain Management Capabilities in the Era of Information Technology within Industrial Organizations Operating in the Republic of Yemen

Dr. Amol Murgai<sup>1</sup>, Dr. Jyoti Mishra<sup>2</sup>, Prof. Rekha Gothe<sup>3</sup>, Mr. Manoj Kumar K<sup>4</sup>

<sup>1</sup>Professor and Dean (I.R) – Department of M.B.A, Late Sau. K. B. Jain College of Engineering, Chandwad, Maharashtra

<sup>2</sup>Associate Professor - School of Commerce and Management Studies, Dayananda Sagar University, Bengaluru

<sup>3</sup>Assistant professor - PES University, Bangalore

<sup>4</sup>Teaching Intern PES University, Bangalore

Email: <sup>1</sup>murgai.arcoe@snjb.org, <sup>2</sup>jyotimishra-scms@dsu.edu.in, <sup>3</sup>rekhad44@gmail.com, <sup>4</sup>manojkumark4247@gmail.com

**Abstract:** Supply chain management plays a significant role in manufacturing tasks inside and strengthens collaboration among suppliers and customers. This paper examines the Supply Chain Management Capabilities (SCMC) level practiced in Yemen manufacturing. A geographically clustered sample was employed; thirty-nine manufacturing companies were surveyed in five governorates, and top and middle managers were asked to answer the questionnaire. Descriptive and standard deviations were used to measure the level of SCMC practice. The findings show high SCMC practice in Yemen's manufacturing is elevated and supported by consistency in deviation scores.

**Keywords:** Supply chain management Capabilities, Inbound Transportation, Material Warehousing, Inventory Control- Inbound, Production Support, Packaging, Finished Goods Warehousing, Inventory Control- Outputs, and Outbound Transportation.

---

## 1. Introduction

To ensure continuous competitiveness, organizations must acknowledge the importance of supplychain practices that not only enhance their own performances but also create value through optimal customer satisfaction and help significantly improve a business's overall performance [1].

Organizations seek competitive capabilities that exceed customers' expectations and improve the market and financial performance [3]-[4]. Despite the significant role played by certain supply chain activities (e.g. transportation and warehousing) in cost containment, supply chain management (SCM) was an aspect long overlooked as a potential area for achieving sustainable competitive advantage [4]. The study aims to empirically test the supply chain management capabilities- SCMC practices in manufacturing companies in Yemen, as these manufacturing companies seek to secure a competitive position and organizational performance improvement.

However, SCM has shifted from an emphasis on passive cost control to a proactive role in shaping managers to recognize that building effective supply chains opens doors of opportunities to generate sustainable competitive advantage [5]-[6]. SCM's positive impact is evident through product availability, efficient order-to-delivery cycle time, reasonable costs, and good customer service. The advantages are sustainable because success necessitates merging diverse and sometimes conflicting groups within and between organizations to achieve common goals.

Manufacturing in Yemen plays an essential role in the Yemeni economy as indicated by the following facts number of employees in the industry sector was (162750) employee and the export volume for the industry

sector was (9.85%) of the total exporting volume in 2005 (Central Statistical Organization, 2005). Furthermore, it is regarded as one of the newest manufacturers, described by its vigorous weaknesses and propriety nothingness of the vertical and horizontal levels, and it doesn't have forward and backward linkage like what is known in solid and effective manufacturing. It largely depends on imported intermediate and raw materials in production. Also, it faces many external and internal strangulation and challenges, which constrain its prosperity and development [7].

In addition, there is a wake role of forward and backward interrelation in the national economy in general and the manufacturing sector in particular. Thus, adopting a broad and extensive motive system is necessary to motivate manufacturers dependent on local raw materials, labor density, and forward and backward interrelation and integration with other national economic sectors [8]. This research will empirically test the supply chain management capabilities (SCMC) practices in manufacturing in the Republic of Yemen. The following will present related literature, methodology, and findings, followed by conclusions.

## **2. Literature Review**

### **a. Supply Chain Management**

Being a complex subject, the SCM is an essential determinant of the success or failure of any manufacturing enterprise [2]. Integrating key business processes from end users through original suppliers provides products, services, and information that add value to the customers and other stakeholders [10]. First used in the early 1980s [11], the term SCM refers to the alignment of firms that bring products or services to market [10], which include transporters, warehouses, retailers, and customers themselves [12]. To remain effective in today's competitive environment, firms must expand their integrated behavior to bring customers and suppliers together [13], and ensure superior supply chain management's impact on a firm's operational and financial performance [14]; its capabilities serve as a source of competitive advantage.

These advantages [15]. Companies must practice SCMC for their advantages and future growth, even though obstacles are inevitable when executing supply chain management within their context [7].

### **b. Supply Chain Management Capabilities**

For competitiveness, organizations must acknowledge the importance of supply chain practices that improve their performances and create value by optimizing customer satisfaction and helping significantly improve a business's overall performance [1]. The concept of capabilities and building distinctive capabilities or competencies were established by [16]. Capabilities and organizational processes are very much related because they are the capabilities that enable the activities in a business process to be done [17].

Thus, the capability and its strategic importance lie in their demonstrable contribution to sustainable competitive advantages [15]. Supply chain capabilities refer to an organization's ability to recognize, use, and merge internal and external resource information to help smooth the entire supply chain's activities [18].

Similarly, Day [17] mentioned that every company planning to be a "market-driven organization" must sustain specific distinctive capabilities regardless of the industry in which it competes. It classified supply chain management capabilities into three categories, adopted by [19]. These three classifications are 'First Outside-in processes capabilities, denoting the group of capabilities that enables the company to rival by forecasting and acting on market changes through developing powerful relationships with suppliers, channel members, and customers.

Second, the Inside-out process's capabilities refer to those internal capabilities that allow the firm to manifest the opportunities in the environment. Alternatively, they facilitate the company acting on information in a manner that adds value to customers and assures the organization's viability in the long run. Third, spanning processes capabilities have to do with the processes that support the anticipated needs of patrons fulfilled by the business. They do so primarily through the integration of the outside-in and inside-out capabilities [20]-[21]-[22].

### **Outside-in Capabilities (OIC)**

Businesses today often have tangible assets but do not have the underlying capabilities required to succeed [22]. The purpose of outside-in capabilities is defined by Day [17] as linking the organization with its environment. They are vital for the business to be anticipatory and responsive to fulfill customers' needs concerning quality, product features, and delivery.

Arrangements. Although physical distribution and logistics spanning activities have outside-in elements, the SCM/logistics processes commonly regarded as physical supply best fit Day's outside-in classification.

SCM/logistics processes taking place before or during the production process as potentially distinctive outside-in capabilities are inbound transportation, material warehousing, inventory control (inputs), and production support [19].

**(a) Inbound Transportation**

It is managing the movement of goods from the points of origin (the suppliers) to the manufacturer via truck, air, rail, water, pipeline, or any of the combined methods. It is one of the supply chain's most critical yet overlooked components, and it has always been regarded as a marginal activity across the supply chains [23]. A little research has been done, including transport operations as the supply chain's strategic factor [23]. Inbound transportation may vary regarding the in-transit time, delivery frequency, reliability, cost, damage, and lost freight. The quality of incoming transportation service can also impact a manufacturer's inventory levels, the frequency of stockouts and shutdowns, and the utilization of material handling equipment and labor [24].

**(b) Material Warehousing**

In supporting manufacturing operations, warehouses act as an inbound consolidation and holding point for raw materials and parts. Industrial companies would be using thousands of parts and items. Thus, logistic operations are critical in fulfilling the demands of parts and items needed to prepare daily schedules to fit the changing production plans [25]. Essential materials warehousing activities include receiving, data entry, putting away, picking, and assembly. Any malfunction in this process can negatively affect operations, outbound logistics, and the whole supply chain [19].

**(c) Inventory Control- Inbound**

Inventory is spread all across the supply chain. It includes everything from raw materials to work in process to finished goods carried out by the manufacturers, distributors, and retailers in a supply chain [12]. Additionally, controlling inventory management is crucial in industrial companies for various reasons [26]. Inventory management will require a proper control system because it is one of the most significant company assets [27]. Inventory control must be in sync with purchasing, warehousing, manufacturing, finance, and other areas to keep the integrity of the inventory while reducing the overall expense. This coordination is vital to ensure sensible decisions concerning purchase lot sizes, delivery timings, and stock levels, boosting on-time production, efficient shipping of finished goods, and improving customer satisfaction [19].

**(d) Production Support**

It delineates the conveying of components/ materials to production [19]. [20]. the lead time elapsed from receiving the customer's order until the delivery of finished goods to the customer should be confirmed and taken seriously to identify the re-ordering point and safety stock levels in anticipation of stock out in the warehouse owing to the long lead time. For that, a company's capacity to exploit external possibilities rely on its outside-in capabilities serving its inside-out capabilities [17]. Alternatively, the more skill the the company possesses regarding its OIC, the more proficient it should be in IOC.

- I. Inside-Out Capabilities (IOC) an organization aims to satisfy its customers, as a satisfied customer may be likely to repurchase and refer additional business to the firm [28]. Customers are confident if they receive the products and they ask for together with good delivery service [29]-[30]. Building a reputation promotes long-term prosperity by creating loyal customers who will account for a high proportion of sales and profit growth over time [4]. Day [17]-[19] suggested that the processes performed to transform the raw materials and the parts into the finished product are called inside-out capabilities construct that consists of packaging and finished goods warehousing, among others.

**(a) Packaging**

Industrial companies consider packaging to draw customers' attention to new and existing brands [31]. Packages Packaging is the first SCM/logistics inside-out process to occur. It is one area where there are a tremendous number of opportunities to reduce costs and, at the same time, improve customer service through technological applications [10]. When the conversion process is complete, the finished output must be packaged and labeled to prevent damage and smooth along the efficiency during storing, material handling, and transporting the product. Packaging also serves the marketing function through a few approaches: promotion, provision of product information, and the convenient allowance for the products used by customers [19].

**(b) Finished Goods Warehousing**

Products that have been packaged are kept at the production facility, in a warehouse, and then throughout a distribution network if they are not sent to customers straight away. Warehousing is essential to the modern supply chain's success or failure [32].

**(c) Inventory Control- Outputs**

Inventory is one of many manufacturing companies' most expensive and vital assets [21]. Excellent inventory management regarding finished goods is perhaps a reasonable justification for a firm's success. Finished goods are usually more valuable and consume a lot of storage space and capital. Although not the same across firms, finished goods inventory investment may represent half of the company's asset base [19]. In addition, it is often the case that customers are asking for the product line variety and are often not happy when the delivery has to be postponed. This renders the correct placement and control of specific items vital.

To guarantee customer satisfaction [33]. Additionally, one of the primary benefits of SCM systems is inventory (level and cost) reductions linked with inbound operations and outbound processes [34].

**(d) Outbound Transportation**

It sustains the flow of finished goods from the plant through the distribution network and often concludes with customer delivery- the last stage of the process. Its effectiveness relies on choices made concerning the method of shipment, the specific carrier(s) used, the route, and compliance with local, state, federal, and international regulations. To reduce the operating cost of a supply chain, a firm must also reduce the cost of production facilities and transportation components [35]. Even though it accounts for a significant share of a product's price and is very important to customer satisfaction, transportation is often 'leaking' in SCM [36]. It is found that outbound transportation is one key to providing value to customers. Many firms can confirm that success also involves responding to unmet customer needs with unique products and delivery systems [37]-[38].

**i. Spanning Capabilities (SC)**

Day (1994) states that spanning capabilities ensure that the organization's processes emphasize providing superior value to external or internal customers. The spanning capability sheds light on developing the information dissemination capabilities within the supply chain as an essential factor in gathering and exchanging the different data in the supply chain for developing its strategy [39]. These capabilities give the horizontal connections that ensure the resources available in the supply chain. Purchasing, customer order processing, and strategy development are categorized by Day [17] as being included in the spanning processes. Information dissemination has been acknowledged as a crucial component of SCM as logisticians pay attention to providing superior service to internal and external clients [40]. The dissemination of information across an organization's supply chain, which is thought to be very timely, helps it respond positively to opportunities uncovered in the environment. Information dissemination will be regarded here as a fourth SCM/logistics-spanning process.

**(a) Purchasing**

The tasks of the purchasing departments are to buy the raw materials, purchased parts, machinery, supplies, and all other goods and services that are of use in the production systems. Purchasing has a severe impact on a firm; also, it is not just about "buying things" [29]-[41]. Purchasing and supply management (PSM) stands to deliver several crucial functions for the effective and efficient operations in manufacturing companies [42]; the procurement function has a positive influence on the efficiency of supply chain cycle time, supply lead time, level of delivering supplies with free defect rate, and many other processes [43]. Procurement has been designated a critical activity by academics [44] and top manufacturers [45]. From a spanning angle, purchasing gives the "nuts and bolts" - materials, machinery, supplies, and outside services - the organization must act on the information about what customers need [19]. This function ascertains how much to buy, the supplier(s) selected, the level of quality delivered, the price paid, the location, and how the goods will be presented. Purchasing personnel are the direct link with the external suppliers [46]. They are also the integrators with an extensive interface with other firm areas, including warehousing, inventory management, inbound traffic, and outbound transportation [47]. How well purchasing performs in these areas significantly impacts the supply chain's ability to fulfill the client's needs and performance.

**(b) Customer Order Processing**

Order processing involves directing the activities from when the firm receives an order until the customer and payment receive the order is secured. The council of supply chain defines the fulfillment of the customers' orders as a percentage of meeting the received orders based on keeping complete and accurate documents and delivering

them intact and safely [48]. When a firm administers each order it receives, it also manages customer service [49]. The effectiveness of the order fulfillment process is most apparent at the point of final interaction (product delivery) to the customer (Schary, 1992). By understanding the key elements of operations management and its impact on supply chains, businesses can streamline their processes, reduce costs, enhance product quality, and ultimately gain a competitive edge in the dynamic and demanding world of contemporary commerce [56].

### (c) Strategy Development

Functional managers with different viewpoints in the strategy process can motivate the diversity in vision, consistency, and unity between actual and perceived environmental uncertainty, and the dissemination of new ideas will result in better business performance [50]. The development of strategic supply chain management has provoked a lot of arguments in the past, where it is not merely a function that lends support to the business strategy. Still, it is integral to a business strategy [51].

### (d) Information Dissemination

Information sharing is essential when organizing the supply chain activities and deciding how critical information is being shared among the supply chain members, namely the customer, the product, and the market [52]. Information gathered by SCM can offer the means for cross-functional teams to respond resourcefully to the environment around them [53]. Modern information systems work based on material flows, and logisticians can collect, act on, and disseminate information about customer needs across the supply chain [46]. In other words, logisticians are exceptionally positioned to adopt information technology to improve customer service and marketing performance [5]. The information serves two purposes in the supply chain and they are organizing daily activities and forecasting and planning [54].

## 3. Methodology

It used a quantitative approach to test and empirically describe the SCMC practices within Industrial organizations of the Republic of Yemen (listed in the Ministry of Manufacturing and Trading) that constituted the population of this study. A sample is taken on a geographical cluster from five governorates in Yemen to represent this population, considering each organization must be in business for at least five years and must be classified as a large organization (25 employees and more) [7]- [55]. Due to the importance of this sector in the Yemeni economy, it represents 9.85% of the total exporting volume and employs 162750 [55]. Then, the researcher adopted a 5- 5-point Likert Scale that measures SCMC from [19] and validated and presented it to a group of expert doctors in Yarmouk University to ensure that the questionnaire includes study dimensions and its items match the study's objectives. A total of (48) questionnaires were distributed to the study sample and collected back. Out of the (48) questionnaires, only (39) of them were suitable for statistical analysis. The reliability of an instrument indicates the stability and consistency with which it measures the concept. The most popular reliability test is Cronbach's alpha, which measures the internal consistency of an instrument. The questionnaire was exposed to this test, and Table 1. Demonstrates the results found. The results show that the alpha value for all study constructs was more than (60%) which represents a satisfactory value to analyze the results depending on the current instrument measure [54].

Table 1. Reliability Coefficient of the SCMC Questionnaire

N	Construct	Code	No.	Alpha
Outside in Capabilities		OIC		
1	Inbound	IT	4	0.72
2	Material Warehousing	MW	4	0.76
3	Inventory Control - inbound	ICI	6	0.75
4	Production Support	PS	5	0.85
	Overall		19	0.91
Inside-Out Capabilities		IOC		
5	Packaging	PK	7	0.83

6	Finished Goods Warehousing	FGW	4	0.81
7	Inventory Control - outbound	ICO	5	0.64
8	Outbound Transportation	OT	4	0.74
	Overall		20	0.88
	Spanning Capabilities	SC		
9	Purchasing	PR	6	0.87
10	Customer Order	COP	4	0.89
11	Strategy Development	SD	5	0.86
12	Information Dissemination	ID	5	0.92
	Overall		20	0.94

#### 4. Discussion

Managers are the source of information regarding supply chain management capabilities adopted and practiced in 39 manufacturing. Table 2. Shows that all of the respondents are males, (48.7%) of them their ages are between 30 and less than 40 Years, (56.4%) of the surveyed sample have bachelor's degrees, and (38.46%) have experience in current manufacturing from 7 to 10 years, and (33.33%) of them have overall experience in the range from 10 to 20 years.

Table 2. Distribution of Managers According to Demographic Characteristics

Variable	Item	F	%
Gender	Male	39	100%
	Female	0	0%
	Total	39	100%
Age	Less than 30 Year	9	23.1%
	30 —less than 40 Years	19	48.7%
	40 - less than 50 Years	5	12.8%
	More than 50 Years	6	15.4%
	Total	39	100%
Level of education	Secondary School or Less	9	23.1%
	Diploma	3	7.7%
	Bachelor	22	56.4%
	Master	5	12.8%
	Doctoral	0	0
	Total	39	100%
Experience in Current Organization	Less than 3 Years	1	2.56%
	From 3 to less than 7 years	12	30.77%
	From 7 to 10 Years	15	38.46%
	More than 10 Years	11	28.21%
	Total	39	100.00%
Overall experience	Less than 10 Years	19	48.72%
	From 10 to 20 Years	13	33.33%
	More than 20 Years	7	17.95%



	Total	39	100.00%
--	-------	----	---------

The demographic characteristics of surveyed organizations are displayed in Table 3. Demonstrates the distribution of the surveyed organizations according to some organizational-related features. Regarding organization age, 17.95% of organizations have less than seven years of experience, 38.46% have had ages from 7 to 15 years, and 43.59% have had more than 15 years of experience. The scores of the surveyed organizations reflected the experiences of these organizations in the industrial sector. Also, according to the size of these organizations, 28.21% of organizations have less than 50 employees. 38.46% have from 50 to 150 employees. 25.64% have more than 150 and less than 500 employees, and 7.69% have more than 500 employees.

Table 3. Distribution of Organizations According to Organizations' Characteristics

Item		F	%
OrganizationAge	Less than 7 Years	7	17.95
	From 7 to 15 Years	15	38.46
	More than 15 Years	17	43.59
	Total	39	100%
Size	Less than 50 workers	11	28.21
	From 50 to 150 workers	15	38.46
	Above 150 and less than 500 workers	10	25.64
	More than 500 workers	3	7.69
	Total	39	100%

#### Question Number One:

To what extent are the industrial organizations in the Republic of Yemen practicing, and do they have the necessary capabilities to supply chain capabilities (OIC, IOC, and SC)?

For more clarity on the level of SCMC adoption and practice, the range (1- 2.49) indicates weak degrees, (2.5- 3.49) indicates moderate degrees, and (3.5 and more) indicates high degrees. To answer this question, the managers are asked to evaluate their adoption and practice. Also, the means and standard deviations for these items of each supply chain management capability (OIC, IOC, and SC) will be displayed.

#### 4.1 Outside-In Capabilities

Organizations, especially in the industrial sector, need a robust system connecting them with the outside (supplier). And to deal seamlessly with the transaction of the raw materials, warehousing system, inventory system, and production support, which represent the elements of OIC. Depending on the mean scores presented in Table 4. These capabilities are imperative for organizations to survive in a competitive, solid environment.

Managers are asked to evaluate their practice for inbound transportation, material warehousing, inventory (inbound), and production support regarding items listed in Table 4. As this table shows, companies have scored higher than 3.50 (which indicates high degrees of adopting and practicing) in all of the inbound transportation items. Also, the standard deviations of items are between (0.73 - 0.92), which supports the homogeneity of the surveyed sample's opinions. Material warehousing items mean scores are 4.31, indicating the importance of the warehousing function for all industrial organizations. That is supported by consistency in the surveyed sample, which concluded from standard deviation scores (0.73, 0.73, 0.74, and 0.73) for items from 5 to 8. In Inventory Control (inbound), results indicate that the mean scores of items (9 and 10) are (4.51 and 4.21), respectively. They reflect a high level of obtaining and practicing inventory control by surveyed sample managers. The item numbers (11 and 12), concerned with the overall quality and accuracy of inventory records for incoming material, have mean scores of 4.23 and 4.36, respectively. Also, items (13, 14) got mean scores of 3.85 and 4.21, respectively.

Additionally, the overall mean score is 4.23, which reflects a high level of practice for inventory control capability by the surveyed sample. The consistency of their opinions supports that.

As concluded from standard deviation scores (0.64, 0.66, 0.67, 0.74, and 0.73) for items from 9 to 14, respectively. Finally, Table 4. Shows that the production support means scores are (4.36, 4.38, 4.46, 4.38, and

4.44) for items from 15 to 19, respectively. These reflect the high level of practice for meeting schedules regarding transferring materials to production and moving materials to the correct production location. Delivering materials in a form conducive to smooth handling by manufacturing/ assembly and responding expediently to special requests. That reflects the overall quality of production support enhanced by the homogeneity of surveyed managers' opinions. That is presented in the standard deviation scores 0.71, 0.59, 0.64, 0.71, and 0.68, respectively, for items from 15 to 19, respectively.

**Table 4. Means and Standard Deviations of Outside-In Capabilities (OIC) Items, (n=39)**

<b>OIC</b>	<b>Item No</b>	<b>M</b>	<b>St. Dev.</b>	<b>Over all M</b>	<b>Over all St. Dev.</b>	<b>Level of Practicing</b>
Inbound Transportation-IT	IT1	3.90	0.88	3.96	0.62	High
	IT2	3.87	0.92			
	IT3	4.18	0.76			
	IT4	3.90	0.82			
Material warehousing- MW	MW5	4.31	0.73	4.31	0.56	High
	MW6	4.31	0.73			
	MW7	4.33	0.74			
	MW8	4.31	0.73			
Inventory	ICI9	4.51	0.64	4.23	0.50	High
Control (inbound) ICI	ICI10	4.21	0.66			
	ICI11	4.23	0.67			
	ICI12	4.36	0.74			
	ICI13	3.85	1.01			
	ICI14	4.21	0.73			
Production Support- PS	PS15	4.36	0.71	4.40	0.54	High
	PS16	4.38	0.59			
	PS17	4.46	0.64			
	PS18	4.38	0.71			
	PS19	4.44	0.68			
<b>Total</b>				4.20	0.48	High

#### **4.2 Inside-Out Capabilities (IOC)**

The internal capabilities are enabling the firm to exploit opportunities in the environment. In other words, they facilitate the company acting on information that brings value to customers and assures the organization's viability in the long run. These capabilities include packaging, finished goods warehousing, inventory control (outbound), and transportation.

Table 5. Displays mean and standard deviations for each packaging capability item of surveyed organizations to measure the adoption and practice level. Mean scores are 4.26, 4.41, 4.28, 4.28, 4.18, 3.92, and 4.18 for items from 20 to 26, respectively. That reflects the high level of adoption and practice for this function, supported by consistency in the opinions of the surveyed sample. That is observed in standard deviation scores 0.82, 0.82, 0.94, 0.92, 0.88, 0.96, and 0.82 for items from 20 to 26, respectively—table 5. The finished goods warehousing mean scores for items from 27 to 30 (4.33, 4.18, 4.26, and 4.26), respectively. They reflect a high degree of adoption and practice by the surveyed sample. This result is supported by consistency in respondents' opinions that concluded from convergence in the standard deviation scores (0.74, 0.79, 0.75, and 0.72) for the above items—table 5. The surveyed sample's inventory control (outbound) practices are 4.56, 4.33, 3.67, and 4.10 for items from 31 to 34, respectively. As a result, they show a high level of training for inventory control functions concerned with the outputs of organizations. Supported by consistency in their opinions, standard deviation scores are (0.60, 0.81, 0.90, and 0.72) for items from 31 to 34, respectively. But item (35) reflects inconsistency in respondents' opinions, shown in its standard deviation score of 1.07. Finally, outbound transportation function. Table 5. It delivers high mean scores of 4.1, 4.23, 4.15, and 4.33 for items from 36 to 39. That means the organizations are considering this capability as an essential function for managing and transporting outputs, which comes with the nature of work for these organizations. The consistency in their opinions supports this result from closeness in standard deviation scores, which are 0.91, 0.81, 0.67, and 0.58 for items from 36 to 39, respectively.



Table 5. Means and Standard Deviations of Inside-Out Capabilities (IOC) Items, (n=39)

IOC	Item No	M	St. Dev.	Over all M	Over allSt. Dev.	Level of Practicing
Packaging	P20	4.26	0.82	4.22	0.72	High
	P21	4.41	0.82			
	P22	4.28	0.94			
	P23	4.28	0.92			
	P24	4.18	0.88			
	P25	3.92	0.96			
	P26	4.18	0.82			
Finished goods warehousing	FGW27	4.33	0.74	4.26	0.61	High
	FGW28	4.18	0.79			
	FGW29	4.26	0.75			
	FGW30	4.26	0.72			
Inventory Control (outbound)	IC31	4.56	0.60	4.04	0.54	High
	IC32	4.33	0.81			
	IC33	3.67	0.90			
	IC34	4.10	0.72			
	IC35	3.51	1.07			
Outbound transportation	OT36	4.18	0.91	4.22	0.52	High
	OT37	4.23	0.81			
	OT38	4.15	0.67			
	OT39	4.33	0.58			
<b>Total</b>				4.21	0.54	High

### 4.3 Spanning Capabilities

Spanning processes include purchasing, customer order processing, strategy development, and information dissemination capability. For purchasing capability. Table 6. Shows high mean scores (4.31, 4.31, 3.79, 4.10, 4.03, and 4.46) for items from 40 to 45, respectively. Those reflect a high level of adoption and practice. That is supported by the consistency in individuals' opinions of the surveyed sample. Concluded from the closeness in standard deviation scores (0.92, 0.83, 0.77, 0.72, 0.81, and 0.76) for items from 40 to 45, respectively. Customer order Processing, Table (513) shows high mean scores of 4.23, 4.08, 4.33, and 4.23 for items from 46 to 49, respectively.

Those clarify the high level of adoption and practice in surveyed organizations. Those define the high level of adoption and practice in surveyed organizations. However, the surveyed managers' opinions are inconsistent for items 46 and 48. That is observed in their standard deviation scores of 1.06 and 1.01, respectively.

Furthermore, Strategic Development Capability. Table 6. Shows mean scores (3.82, 3.77, 3.85, and 4.05) for items from 50 to 54, respectively. That reflects the high level of adoption and practice of this capability in surveyed organizations. Supported by consistency in opinions of surveyed

Managers that concluded from standard deviation scores are 0.88, 0.78, 0.78, and 0.94 for items from 50 to 54, respectively. However, the mean score of 3.46 for item 52 reflects logisticians' median level of involvement in strategic decisions that affect company growth. The consistency in the surveyed managers' opinions concluded from a standard deviation score of 0.85 for the same item. Finally, Information dissemination, Table 6. Shows a high mean score for these capability items. Item 55 asks if the information used to manage logistics activity is readily available. Its mean score is (4.00). It reflects the importance of information systems in any organization, especially in the manufacturing field. All respondents' opinions were consistent with standard deviation scores (0.89, 0.87, 0.95, 0.98, and 0.99) for items 55 to 59, respectively.

## **5. Conclusion**

Conclusions from Characteristics Demographic description of the study sample. All managers in YIOs were males as a percentage (100%), and there weren't any females. The majority of managers' ages are positioned in these ranges (less than 30 years and from 30 to less than 40 years); the managers' ages that were less than 30 years took the percent (% 23.1), and 48.7% for managers aged 30- less than 40 years. Most managers have bachelor's degrees; they form 56.4% of the sample. Most managers have experience in their current organization, ranging from 7 to 10 years, representing 38.46% of the sample. Most managers have less than ten years of overall experience, representing 48.72% of the sample.

Conclusions from characteristics of study population: About 43.59% of studying sample individuals work with organizations ages more than 15 years, and 38.46% of them work with organizations with age ranges from 7 to 15 years. Also, 38.46% of surveyed sample individual's work with organizations with employees ranging from 50 to 150 workers, and 25.64% of them work with organizations with employees ranging from above 150 and less than 500 workers. Most of the surveyed sample individuals work with foodstuffs and beverages organizations, representing 17.95% of the sample; 10.26% work with medicine organizations, and 10.26% work with carton and packaging organizations.

The level of adopting and practicing is high for all SCMCs; in Outside-In Capabilities (OIC), the mean score is 4.20; in Inside-out capabilities (IOC), the mean score is 4.21; and the Spanning Capabilities have a mean score (of 4.01). As the study indicates, the level of practice for SCMCs' mean score is 4.12 with a standard deviation score (of 0.19), which reflects the consistency in the surveyed sample opinion regarding this level of practice.

## **Recommendation**

Based on the findings of this study, the researcher suggests that YIO managers are encouraged to adopt and practice SCM in their organizations. Particularly when it proves its merits and contribution to the business performance, YIO managers are advised to create a department assigned to manage SCM-related elements and decisions as a base for reaching and achieving SC collaboration. YIO managers must terminate the obstacles that hinder SCM practice by providing sophisticated information systems for information sharing among supply chain members, enhancing the cooperation among supply chain members, motivating suppliers and customers to participate in the supply chain, and adapting new techniques in managing inventories throughout the entire supply chain. YIOs managers are encouraged to attend training programs in supply chain management. This will enable them to understand the practice of SCM and how to apply it in their organizations. YIOs seeking SC must focus on the three interrelated capabilities of SCM as an enabler for gaining a competitive advantage. YIO managers are encouraged to cooperate with local Yemeni universities to suggest courses that positively influence fresh graduates' contribution and knowledge.

## **6. References**

1. Cook, L.S., Heiser, D.R., and Sengupta, K., "The moderating effect of supply chain role on the relationship between supply chain practices and performance: An empirical analysis". *International Journal of Physical Distribution & Logistics Management*, Vol 41, No. 2, p. 104-134, 2011.
2. Ganeshkumar, C. and Nambirajan, T., "Supply Chain Management Components, Competitiveness and Organisational Performance: Causal Study of Manufacturing Firms", *Asia-Pacific Journal of Management Research and Innovation*, Vol 9, No. 4, p. 399-412, 2013.
3. Hayes, R.H. ,and Pisano, G.P., "Beyond world-class: the new manufacturing strategy", *Harvard business review*, Vol 2, No. 1, p. 7786, 1994.
4. Lado, A.A., Boyd ,N.G., and Wright P., "A competency-based model of sustainable competitive advantage: Toward a conceptual integration", *Journal of management*, Vol 18, No. 1, p. 77-91, 1992.
5. Cooper, M.C., Lambert,D.M., and Pagh, J.D., "Supply chain management: more than a new name for logistics", *The International Journal of Logistics Management*, Vol 8, No. 1, p. 114, 1997.
6. Higginson, J.K. and Alam, A., "Supply chain management techniques in medium-to-small manufacturing firms". *The International Journal of Logistics Management*, Vol 8, No. 2, p. 19-32, 1997.
7. Abualrejal, H.M, Abu Doleh, J. D., Salhieh, L. M., Udin, Z. M., & Mohtar, S, "Barriers of Supply Chain Management Practices in Manufacturing Companies in Republic of Yemen: Pre-War Perspective", *International Journal of Supply Chain Management*, Vol 6, No. 3, 246-251, 2017.
8. Abu Al-Rejal, H.M, J.D. Abu-Doleh, and
9. L. M. Salhieh, "The Impact of Supply-Chain Management Capabilities on Business Performance of Industrial Organizations in Republic of Yemen: A Field Study", Master thesis, Yarmouk University,

- 2007.
11. Weeks, K. and Mileski, J., "The Impact of Resource Commitment, Product Route Efficiency on Supply Chain Performance and Profitability: An Empirical Case Analysis", *Journal of Business and Management Sciences*, Vol 1, No. 5, p. 105-111, 2013.
12. Lambert, D.M., Cooper, M.C., and Pagh, J.D., "Supply chain management: implementation issues and research opportunities", *The International Journal of Logistics Management*, Vol 9, No. 2, p. 1-20, 1998.
13. Oliver, R.K. and Webber, M.D., "Supply chain management: logistics catches up with strategy", *Outlook*, Vol 5, No. 1, p. 42-47, 1982.
14. Meindl, P. and Chopra, S., "Supply Chain Management: Strategy, Planning, And Operation", 5/e. Pearson Education India, 2001.
15. Bowersox, D.J., Closs, D.J., and Stank, T.P., "Ten mega-trends that will revolutionize supply chain logistics", *Journal of Business Logistics*, Vol 21, No. 2, p. 1, 2000.
16. Fullerton, R.R., McWatters, C.S., and Fawson, C., "An examination of the relationships between JIT and financial performance", *Journal of Operations Management*, Vol 21, No. 4, p. 383-404, 2003.
17. Peteraf, M.A., "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol 14, No. 3, p. 179-191, 1993.
18. Penrose, E.T., "The theory of the firm's growth", Cambridge, MA, 1959.
19. Day, G.S., "The capabilities of market-driven organizations. *The Journal of Marketing*, p. 37-52, 1994.
20. Bharadwaj, A.S., "A resource-based perspective on information technology capability and firm performance: an empirical investigation", *MIS quarterly*, p. 169-196, 2000.
21. Tracey, M., Lim, J.S., and Vonderembse,
22. M. A. Vonderembse, "The impact of supply chain management capabilities on business performance", *Supply Chain Management: An International Journal*, Vol 10, No. 3, p. 179- 191, 2005.
23. Mekel, C., Anantadjaya, S.P., and Lahindah
24. L., "Stock Out Analysis: An Empirical Study on Forecasting, Re-Order Point and Safety Stock Level at PT Combiphar", Indonesia. 2014.
25. Ogbo, A.I. and Ukpere, W.I., "The impact of effective inventory control management on organizational performance: A study of 7up bottling company nile mile enugu, Nigeria", *Mediterranean Journal of Social Sciences*, Vol 5, No.10, p. 109, 2014.
26. Sabry, A., "The Impact of Supply-Chain Management Capabilities on Business Performance in Egyptian Industrial Sector", *International Journal of Business and Management*, Vol 10, No. 6, p. 251, 2015.
27. Sanchez Rodrigues, V., Stantchev, D., Potter, A., Naim, M., & Whiteing, A., "Establishing a transport operation focused uncertainty model for the supply chain", *International Journal of Physical Distribution & Logistics Management*, Vol 38, No. 5, p. 388-411, 2008.
28. Bowersox, D. and Daugherty, P., "Logistical Excellence: It's Not Business as Usual", Digital Press, Burlington, MA, 1992.
29. Kempkes, J.P., Koberstein, A., and Suhl, L., "A resource-based mixed integer modeling approach for integrated operational logistics planning, in *Advanced Manufacturing and Sustainable Logistics*," Springer. p. 281-294, 2010.
30. Lwili, T., Ojera, P. B., Mugenda, N. G., & Wachira, V. K., "The impact of inventory management practices on the financial performance of sugar manufacturing firms in Kenya," *International Journal of Business, Humanities, and Technology*, Vol 3, No. 5, p. 75-85, 2013.
31. Mogere, K., Oloko, M., and Okibo, W., "Effect Of Inventory Control Systems On Operational Performance Of Tea Processing Firms: A Case Study Of Gianchore Tea Factory, Nyamira County, Kenya", *The International Journal Of Business & Management*, Vol 1, No. 5, p. 12- 27, 2013.
32. Innis, D.E. and La Londe, B.J., "Customer service: the key to customer satisfaction, customer loyalty, and market share", *Journal of business Logistics*, Vol 15, No. 1, p. 1, 1994.
33. Bregman, R., "Integrating marketing, operations, and purchasing to create value. *Omega*, Vol 23, No. 2, p. 159-172, 1995.
34. Parasuraman, A., Berry, L.L., and Zeithaml, V.A., "Understanding customer expectations of service", *MIT Sloan Management Review*, Vol 32, No. 3, p. 39, 1991.
35. Mukai, S. "Analysis of common cognition of impression among Japanese firms and tea beverage packaging", in *KEER2014. Proceedings of the 5th Kansei Engineering and Emotion Research; International Conference; Linköping; Sweden; June 11-13. Linköping University Electronic Press*, 2014.
36. Baker, P., "An exploratory framework of the role of inventory and warehousing in international supply chains", *The International Journal of Logistics Management*, Vol 18, No.1, p. 64-80, 2007.
37. Bowen, D.E., Siehl, C., and Schneider, B., "A framework for analyzing customer service orientations in

- manufacturing”, *Academy of Management Review*, Vol 14, No. 1, p. 75-95, 1989.
38. Rungtusanatham, M., Salvador, F., Forza, C., & Choi, T. Y., “Supply-chain linkages and operational performance: A resource-based- view perspective”, *International Journal of Operations & Production Management*, Vol 23, No. 9, p. 1084-1099, 2003.
39. Meisel, F., Rei, W., Gendreau, M., &
40. Bierwirth, C., “The Design of Supply
41. Networks Under Maximum Customer Order Lead Times”, *Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT)*, 2011.
42. Thompson, R.H., “Supply Chain Management: Teaming for Success”, 1997.
43. Trunick, P., “Logistics leaders focus on a solution,” *Transportation and Distribution*, Vol 38, No. 8, p. 25-32, 1997.
44. Gilmore, J.H. and Pine, B.J., “The four faces of mass customization” *Harvard Business Review*,
45. Vol 75, p. 91-101, 1997.
46. Bechtel, C. and Jayaram J. Jayaram, “Supply chain management: a strategic perspective”, *The International Journal of Logistics Management*, Vol 8, No. 1, p. 15-34, 1997.
47. Fawcett, S. and Clinton, S., “Enhancing logistics to improve the competitiveness of manufacturing organizations: A triad perspective”, *Transportation Journal*, Vol 18, No. 2, p. 16-23, 1997.
48. Knight, L., Harland, C., Telgen, J., Thai, K.
49. V., Callender, G., & McKen, K., “Public procurement: International cases and commentary”, *Routledge*, 2012.
50. Kadima, Z.R., Douglas, M., Kibet, Y., & Manase, G. W., “An analysis of procurement procedures on the implementation of Government construction projects in Kenyan Public Universities: case study of Masinde Muliro University”, *International Journal of Innovative Research and Development*, Vol 2, No. 11, 2013.
51. Porter, M.E., “Competitive advantage: creating and sustaining superior performance”, *New York: Free Press*, 1985.
52. Fitzgerald, K.R., “For Superb Supplier
53. Development—Honda Wins! *Purchasing*”, Vol 119, No. 4, p. 32-40, 1995.
54. Cooper, M.C. and Ellram, L.M., “Characteristics of supply chain management and the implications for purchasing and logistics strategy”, *The international journal of logistics management*, Vol 4, No. 2, p. 1324, 1993.
55. Vonderembse, M., Tracey, M., Leng Tan, C., & Bardi, E. J., “Current purchasing practices and JIT: some of the effects on inbound logistics”, *International Journal of Physical Distribution & Logistics Management*, Vol 25, No. 3, p. 33-48, 1995.
56. Muzumdar, M. and Zinzuwadia A., “Secrets to successful order fulfillment”, *Supply Chain Management Review*, Vol 17, No. 6, 2013.
57. Cohen, M.A. and Lee, H.L., “Out of touch with customer needs? Spare parts and after-sales service”, *MIT Sloan Management Review*, Vol 31, No. 2, p. 55, 1990.
58. Bourgeois, L.J., “Strategic goals, perceived uncertainty, and economic performance in volatile environments”, *Academy of Management Journal*, Vol 28, No. 3, p. 548-573, 1985.
59. Venus, K., “Supply Chain Management-Part of Strategic Management”, *Journal of Business and Economics*, Vol 5, No. 7, p. 1052-1067, 2014.
60. Ahmad, N., and Saifudin, A.M., “Supply chain management in telecommunication industry: The mediating role of logistics integration,” 2014.
61. Manheim, M.L., “Global information
62. technology: Issues and strategic opportunities”, *International Information Systems*, Vol 1, No. 1, p. 38-67, 1992.
63. Hugos, M., “Essentials of Supply Chain Management”, *John Wiley & Sons. Inc. New Jersey*, 2003.
64. Sekaran, U., “Research methods for business: A skill-building approach”, *John Wiley & Sons*, 2000.
65. Central Statistical Organization, “Planning Ministry of Republic of Yemen Report, Central Statistical Organization”. *Yemen*, 2005.
66. Verma, Neha, Purnendu Kumar Patra, Ritesh Sharma, Nikhil Polke, Priyanka Rawal, and Ganesh Waghmare. "Gaining New Insights into Consumer Behavior through Operations Management in Supply Chains." In *Utilization of AI Technology in Supply Chain Management*, pp. 274-288. *IGI Global*, 2024.