Impact of Digitalization in Supply Chain and Logistics Arena in UAE

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Abstract

Supply chain Management and logistics are key areas for any business. Technologies in sustaining the strategic role supply chain management and logistics has enabled the much-needed integration of operations towards common goals. It has become essential for all sectors to identify the relevance of digitalization and devise strategies accordingly. The present research studies the significance of digitalization with reference to Construction, Mall & Hyper Markets, Supply Chain & Logistics, Trading and Others. We have taken responses/feedback from entities / business who handles Logistics / supply Chain to to identify the impact of digitalization in Supply Chain and Logistics using statistical findings and critical values.

Keywords: Supply chain Management, Logistics, Digitalization.

Introduction:

Supply chains comprise of activities and networks of organizations that work together and independently to produce and deliver goods and services from source right up to consumption. The key flows that are essential for effective performance of supply chain operations are ***physical flows of goods, money flows and information flows*** (Christopher, 2016). The effectiveness of supply chains is determined on how efficient these key flows are to ensure the right product/service of the right quantity and quality is delivered ***to the right place, at the right time and cost/price***, (Monczka et al, 2015). This is where supply chain management derived its strategic position in boardrooms ***as a source of competitive edge for business, offering opportunities for enhancement of shareholder value and customer service***(Christopher, (2016) also posited that much of product or service costs are incurred outside the organization's boundaries, which means, supply chain activities upstream and downstream have a large bearing on the final product costs and subsequently, price changed to the customer. The arguments therefore are that effective management of logistics and supply chain operations can enhance productivity and reduce costs. On the other hand is value added service offering for businesses. Most products have direct or indirect substitutes to an extent that they may be considered 'commodities' in the market place. The only differentiators outside price come from the value adding provided in the key service deliveries as provided by supply chain operations. Christopher, (2016) stated that supply chain operations can be tailor-made to suite distinct market value segments for different groups of customers. Customer service has gained popularity on the market as a key differentiator in those areas like delivery, after sales or technical support. This is another dimension that has elevated supply chain management to a strategic role because of its value added to both the customer and the other stakeholders of the business. It is therefore an acceptable conclusion that logistics and supply chain management offers businesses with immense opportunities for both cost reduction and value creation. For example, cost reduction through improvements in asset utilization, productivity and waste reduction/removal; value creation through superior service and product offering for different market segments. Challenge is whether businesses have seen this source of competitive edge and value creation and how ***they are taking advantage of supply chain management for sustainable performance*** (Michel Porter, (2008)) argued that a firm in itself does not offer competitive advantages, but rather through the value chain that comprise of various activities and processes performed by the different partners of the supply chain. Supply chains are operating in an environment of rapid changes, brought about by market dictates and technological changes. Evidence abound from research that efforts are being undertaken to develop the digital technologies for managing the interface between supply chain networks and other key activities of supply chain management. Managing these supply chains go beyond basics of processes

automation and transaction between supply chain partners. Whilst these are important facets in managing supply chains, real value is created when managers can see the bigger picture in their supply chain operations so that enabling technologies become essential for this aspect of managing the entire supply chain networks.

Technology & Supply Chain & Logistics

The role played by technologies in sustaining the strategic role supply chain management has enabled ***the much-needed integration of operations towards common goals*** (Stevens and Johnson, 2016). Opportunities for e-supply chain management from through ERP networks are immense for both B2B and B2C market sectors. Advances in adoption of technologies in supply chain operations through information networking and exploitation of data generated from emerging data technologies such as ***ERPs; Data Centers, Cloud technologies and Block chains is gaining momentum*** (Underwood, 2016). Surprisingly, a good number of managers appear oblivious of the competitive advantages that these technologies can drive within their market segments. The Middle East and UAE in particular, would do well by embracing a culture that not only talk about technologies, but also take calculate risks in adoption of these enabling technologies.The objectives of any supply chain operations is to ensure that the right product/service in the right quantity and quality is supplied or delivered to the right customer and the right place, time and cost. The above technologies support the supply chain objective by ensuring that the right supply source is selected. Supplier qualification is key to this procurement process and will reduce risk of contracting with unreliable suppliers. This requires access to up to date data and information on supplier. The case study organization has used a single procurement platform that is integrated with suppliers' downstream. This enables B2B transaction with suppliers in real time, reducing manual interventions, expediting and reducing procurement cycle times. Opportunities for further reduction in ordering costs, inventory holding results in reduction of cost of goods and therefore enhancement of the gross margin. It is clear is that there is a wide variety of emerging technologies that can provide the desired integration between an organizations and its supply chain partners, with ***resultant differentiation in service, value adding and cost reductions*** (Prajogo, D., & Olhager, 2012) . Emerging technologies like, radio frequency identification (RFID); global positioning systems (GPS) and low-power wide area network (LPWAN) are applied in logistics operations for ***asset tracking and material flows monitoring systems in warehouses, production, security during transportation***, (Angeles, 2005) .

These technologies also provide real time information on status; availability and location for both planning and execution. RFID capabilities for real time information transmission coupled with interface connectivity with enterprise resource planning systems, (ERP) like SAP, is a significant contributor to value adding within supply chain operations. Assets including current assets can be tracked and traced from source right through production until they are transformed into finished or semi-finished goods for delivery to the customers. For example, the same technologies have been successfully applied for time sensitive and perishable products that may require special handling and temperature control during transit, thereby reducing damages and deterioration to products in supply chain pipelines.

E-procurement:

E-procurement platforms ***enhances the value adding role for strategic and tactical sourcing for organizations and their supply chain partners***, (Gabhart, & Bhattacharya, 2008 ; Rothaermel, 2015). Whether centralized or decentralized procurement structure, e-procurement has provided organizations with opportunities to minimize supply base and maximize cost reduction shareholder value. Sample organization reported that by integrating together multiple suppler catalogues into a single supply data base, organizations have been able to reduce the purchasing order cycles.

Therefore, successful selection and management of emerging technologies is critical in coping with the changes that may be necessary (Gunasekaran, & Ngai, 2014). This is even more pressing for supply chain operations in developing and emerging markets, where ***there is inadequate capacity and under developed infrastructure provisions***, (Bvepfepfe, 2019) . However, as note by Demirguc-Kunt et.al.,(2018), the payment industry claim lion's share in the Fintech sector in developing countries in 2017, with reports that digital payments rose from

32 percent to 42 percent in 3 years' time period . In Kenya alone, 73 percent of the population use mobile money, Zimbabwe is around 97 percent (Marumbwa, 2014) and other developing countries also showing rapid progress.Block chain is one other technology that is gaining attention within supply chain operations. Block chain is a distributed ledger that ***is shared among participating parties to record transaction and creates trust in the network*** (Abeyratne and Monfared, 2016; Peck, 2017) . Block chain is helping industry ***in better tracking the food supply chain network, reduce costs across logistics and financing,*** (Apte, & Petrovsky, 2016) . It has applications in cutting the time in delivering product to customers and brings accountability at every step — several pioneer initiatives in reviewing block chain principles for example, hawk to protect personal data (Kosba et. al, 2016) . This will help in securing the privacy of information and reduce leakage of information to the outsiders. Halalchain app in Dubai enable consumers to track and trace halal products and ease operations on checking counterfeit product from non-halal sources

Method

The respondents have been chosen specifically from entities / business who handles Logistics / supply Chain who in turn understand the changes on day to day basis. The level of feed back perceived by the selected sample respondents in utilizing the Supply Chain and Logistics trend is considered as a dependent variable. The Independent variables selected for the study are Gender, No.of years in SCM and Logistics, and Annual Turnover of the company they are into. In this study, almost 68.1% of the cases were male and 31.9% of the cases were female. Around 52.8% of the cases were graduates and 37.5% of the cases were post graduates. About 23.6% of the samples were from trading sector, 22.2% each from construction and supply chain & logistics, 13.9% of the samples from mall & hyper markets and 18.1%of the samples from other sectors. Other sector includes agriculture, manufacturing, automobile, advertising and baking.

Table 1: Socio-demographic characteristics of the sample

Personal Details	Frequency	Percent
Sex		
Male	49	68.1%
Female	23	31.9%
Educational Qualification		
UG	1	1.4%
Diploma	2	2.8%
Graduate	38	52.8%
PG	27	37.5%
Others	4	5.6%
Sector		
Construction	16	22.2%
Mall & Hyper Markets	10	13.9%
Supply Chain & Logistics	16	22.2%
Trading	17	23.6%
Others	13	18.1%
Number of Years in SCM & Logistics		
Up to 5	21	29.2%
5 - 10	15	20.8%
10 - 15	24	33.3%
15 - 20	12	16.7%
Annual Turnover		
Dhs. 1-2 M	6	8.3%
Dhs. 2-4 M	11	15.3%
Dhs. 4-10 M	7	9.7%
Dhs. >10 M	48	66.7%

Changes in supply chain process related to your business / industry you work in UAE in last few years (3-5 years)

Table 2: : Statistical findings for changes in supply chain process

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strong Change	10 (62.5%)	4 (40.0%)	6 (37.5%)	2 (11.8%)	3 (23.1%)	25 (34.7%)	0.117
Average Change	6 (37.5%)	5 (50.0%)	8 (50.0%)	13 (76.5%)	8 (61.5%)	40 (55.6%)	
Minimal Change	0 (0.0%)	1 (10.0%)	2 (12.5%)	2 (11.8%)	1 (7.7%)	6 (8.3%)	
Negligible Change	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	1 (1.4%)	
No Change	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Sector					Total (N = 72)
Construction (N = 16)	Mall & Hyper Markets (N = 10)	Supply Chain & Logistics (N = 16)	Trading (N = 17)	Others (N = 13)	
62.5%	40.0%	37.5%	11.8%	23.1%	34.7%
37.5%	50.0%	50.0%	76.5%	61.5%	55.6%
0.0%	10.0%	12.5%	11.8%	7.7%	8.3%
0.0%	0.0%	0.0%	0.0%	7.7%	1.4%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Here the p-value is greater than the significance level 0.05; the difference in the changes in supply chain process related to business / industry in UAE in last few years (3-5 years) between sectors is not significant. That is, there is no significant difference in the changes in supply chain process related to business / industry in UAE in last few years between sectors. The table reveals that strong change was seen in construction (62.5%) compared to mall & hyper markets (40.0%) and supply chain & logistics (37.5%). Trading (76.5%) and other sectors (61.5%) having average change in supply chain process related to business / industry in UAE in last few years.

Changes in logistics related to your business / industry you work in UAE in last few years (3-5 years)

Table 3: Statistical findings for changes in Logistics

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strong Change	11 (68.8%)	3 (30.0%)	8 (50.0%)	2 (11.8%)	6 (46.2%)	30 (41.7%)	0.024
Average Change	5 (31.3%)	6 (60.0%)	6 (37.5%)	13 (76.5%)	4 (30.8%)	34 (47.2%)	
Minimal Change	0 (0.0%)	1 (10.0%)	1 (6.3%)	2 (11.8%)	1 (7.7%)	5 (6.9%)	
Negligible Change	0 (0.0%)	0 (0.0%)	1 (6.3%)	0 (0.0%)	2 (15.4%)	3 (4.2%)	
No Change	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Sector					Total (N = 72)
Construction (N = 16)	Mall & Hyper Markets (N = 10)	Supply Chain & Logistics (N = 16)	Trading (N = 17)	Others (N = 13)	
68.8%	30.0%	50.0%	11.8%	46.2%	41.7%
31.3%	60.0%	37.5%	76.5%	30.8%	47.2%
0.0%	10.0%	6.3%	11.8%	7.7%	6.9%
0.0%	0.0%	6.3%	0.0%	15.4%	4.2%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Here the p-value is less than the significance level 0.05; the difference in the changes in logistics related to business / industry in UAE in last few years (3-5 years) between sectors is significant. That is, there is a significant difference in the changes in logistics related to business / industry in UAE in last few years between sectors. The table reveals that strong change was seen in construction (68.6%) compared to supply chain & logistics (50.0%) and other sectors (46.2%). Mall & hyper markets (60.0%) and trading (76.5%) having average change in logistics related to business / industry in UAE in last few years.

The new logistics concept of e-commerce is becoming more and more popular in UAE

Table 4: Statistical findings for new logistics concept of e-commerce

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strongly Agree	11 (68.8%)	3 (30.0%)	6 (37.5%)	14 (82.4%)	7 (53.8%)	41 (56.9%)	0.027
Agree	4 (25.0%)	5 (50.0%)	10 (62.5%)	3 (17.6%)	6 (46.2%)	28 (38.9%)	
Neutral	1 (6.3%)	1 (10.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (2.8%)	
Disagree	0 (0.0%)	1 (10.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.4%)	
Strongly Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Sector					Total (N = 72)
Construction (N = 16)	Mall & Hyper Markets (N = 10)	Supply Chain & Logistics (N = 16)	Trading (N = 17)	Others (N = 13)	
68.8%	30.0%	37.5%	82.4%	53.8%	56.9%
25.0%	50.0%	62.5%	17.6%	46.2%	38.9%
6.3%	10.0%	0.0%	0.0%	0.0%	2.8%
0.0%	10.0%	0.0%	0.0%	0.0%	1.4%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Here the p-value is less than the significance level 0.05; the difference in the agreement towards 'the new logistics concept of e-commerce is becoming more and more popular in UAE' between sectors is significant. That is, there is a significant difference in the agreement between sectors. The table reveals that the proportion of agreement towards 'the new logistics concept of e-commerce is becoming more and more popular in UAE' is significantly higher in construction (93.8%), supply chain & logistics (100.0%), trading (100.0%) and other sectors (100.0%) compared to mall & hyper markets (80.0%).

Customer focus and satisfaction has improved greatly with IT information in logistics which are on finger tips which makes a lot of difference compared to conventional logistics approach in the past

Table 5: Statistical findings for customer focus and satisfaction with IT information in logistics

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strongly Agree	8 (50.0%)	5 (50.0%)	11 (68.8%)	8 (47.1%)	7 (53.8%)	39 (54.2%)	0.719
Agree	7 (43.8%)	5 (50.0%)	4 (25.0%)	6 (35.3%)	5 (38.5%)	27 (37.5%)	
Neutral	1 (6.3%)	0 (0.0%)	0 (0.0%)	3 (17.6%)	1 (7.7%)	5 (6.9%)	
Disagree	0 (0.0%)	0 (0.0%)	1 (6.3%)	0 (0.0%)	0 (0.0%)	1 (1.4%)	
Strongly Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Here the p-value is greater than the significance level 0.05; the difference in the agreement towards 'customer focus and satisfaction has improved greatly with IT information in logistics which are on finger tips which makes a lot of difference compared to conventional logistics approach in the past' between sectors is not significant. That is, there is no significant difference in the agreement between sectors. The table reveals that

the agreement towards 'customer focus and satisfaction has improved greatly with IT information in logistics which are on finger tips which makes a lot of difference compared to conventional logistics approach in the past' is almost same in construction (93.8%), mall & hyper markets (100.0%), supply chain & logistics (93.8%), trading (82.4%) and other sectors (92.3%).

New shipment tracking system with IT support have made the trade easy in UAE which benefitted by locally and internationally

Table 6: Statistical findings for new shipment tracking system with IT support

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strongly Agree	8 (50.0%)	1 (10.0%)	9 (56.3%)	6 (35.3%)	9 (69.2%)	33 (45.8%)	0.030
Agree	8 (50.0%)	6 (60.0%)	7 (43.8%)	10 (58.8%)	3 (23.1%)	34 (47.2%)	
Neutral	0 (0.0%)	3 (30.0%)	0 (0.0%)	1 (5.9%)	1 (7.7%)	5 (6.9%)	
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Strongly Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Here the p-value is less than the significance level 0.05; the difference in the agreement towards 'new shipment tracking system with IT support have made the trade easy in UAE which benefitted by locally and internationally' between sectors is significant. That is, there is a significant difference in the agreement between sectors. The table reveals that the proportion of agreement towards 'new shipment tracking system with IT support have made the trade easy in UAE which benefitted by locally and internationally' is significantly higher in construction (100.0%), supply chain & logistics (100.0%), trading (94.1%) and other sectors (92.3%) compared to mall & hyper markets (70.0%).

Visibility improvement, reduction in follow up & less human resource requirement experienced by the last 5 years due to digitalization in SCM & logistics

Table 7: Statistical findings for Visibility improvement, reduction in follow up & less human resource requirement due to digitalization in SCM & logistics

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strongly Agree	4 (25.0%)	1 (10.0%)	2 (12.5%)	2 (11.8%)	4 (30.8%)	13 (18.1%)	0.439
Agree	7 (43.8%)	7 (70.0%)	5 (31.3%)	12 (70.6%)	4 (30.8%)	35 (48.6%)	
Neutral	4 (25.0%)	2 (20.0%)	7 (43.8%)	2 (11.8%)	4 (30.8%)	19 (26.4%)	
Disagree	1 (6.3%)	0 (0.0%)	2 (12.5%)	1 (5.9%)	1 (7.7%)	5 (6.9%)	
Strongly Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Here the p-value is greater than the significance level 0.05; the difference in the agreement towards 'visibility improvement, reduction in follow up & less human resource requirement experienced by the last 5 years due to digitalization in SCM & logistics' between sectors is not significant. That is, there is no significant difference in the agreement between sectors. The table reveals that the agreement towards 'visibility improvement, reduction in follow up & less human resource requirement experienced by the last 5 years due to digitalization in SCM & logistics' is almost same in construction (68.8%), mall & hyper markets (80.0%), supply chain & logistics (43.8%), trading (82.4%) and other sectors (61.6%).

Output / productivity improvement experienced in trading business due to digital technology in SCM & logistics by the last 5 years

Table 8: Statistical findings for Output / productivity improvement experienced due to digital technology in SCM & logistics

	Sector					Total (N = 72)	p - value
	C (N = 16)	MHM (N = 10)	SCL (N = 16)	T (N = 17)	O (N = 13)		
Strongly Agree	5 (31.3%)	3 (30.0%)	2 (12.5%)	4 (23.5%)	5 (38.5%)	19 (26.4%)	0.137
Agree	10 (62.5%)	4 (40.0%)	13 (81.3%)	13 (76.5%)	7 (53.8%)	47 (65.3%)	
Neutral	1 (6.3%)	3 (30.0%)	1 (6.3%)	0 (0.0%)	0 (0.0%)	5 (6.9%)	
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	1 (1.4%)	
Strongly Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

C ➔ Construction, MHM ➔ Mall & Hyper Markets, SCL ➔ Supply Chain & Logistics, T ➔ Trading and O ➔ Others.

Here the p-value is greater than the significance level 0.05; the difference in the agreement towards 'output / productivity improvement experienced in trading business due to digital technology in SCM & logistics by the

last 5 years' between sectors is not significant. That is, there is no significant difference in the agreement between sectors. The table reveals that the agreement towards 'output / productivity improvement experienced in trading business due to digital technology in SCM & logistics by the last 5 years' is almost same in construction (93.8%), mall & hyper markets (70.0%), supply chain & logistics (93.8%), trading (100.0%) and other sectors (92.3%).

Conclusion

Strong change was seen in construction, mall & hyper markets ,supply chain & logistics ,trading and other sectors because of change in supply chain process and logistics related to business / industry in UAE in last few years. The new logistics concept of e-commerce is becoming more and more popular in UAE' significantly in construction , supply chain & logistics , trading and other sectors .With the implementation of IT information in logistics and SCM customer focus and satisfaction has improved greatly.Similarly new shipment tracking system with IT support have made the trade easy in UAE. Digitalization in SCM & logistics' has lead to 'visibility improvement, reduction in follow up & less human resource requirement, also output / productivity improvement experienced in trading business .

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