

Critical Success Factor of Information Technology Implementation in Supply Chain Management: Literature Review

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Abstract— The main objective of this research is to explore the success factors of implementation information technology (IT) in supply chain management. The method used is a literature review with meta-analysis approach, meta-analysis used by using keywords that describe the search. The results of this study found 56 success factors, after further analysis found 21 success factors are very influential from the implementation IT, among others: Efficient, Integration, Cost, Effectiveness, Communication, Ability, Timeliness, Accurate, Accurate, Performance, Coordination, Flexible, Automation, Quality, Transparent, Real-Time, Responsiveness, Trust, Speed, Completeness, Relationships, Suitability. This factor gives the company the desire to implement IT in the supply chain. The application of IT has a positive influence on all supply chain activities so it can improve the processes that occur within the company from purchasing raw materials, production processes, logistics, customer service. All this gives the opportunity for a company to compete globally with others.

Keywords— Critical Success Factor, Information Technology, Supply Chain Management, Literature Review

I. INTRODUCTION

In the present century, revolutions have taken place in the mass of IT [1], [2]. These developments occur continuously in all aspects of human life, organization, business, enterprise and all fields that exist today [1], [3]. With these developments provide an enormous impact as well, thus motivating all these aspects to adopt or apply IT. The current implementation of IT is gaining a special policy from the entire corporate

organization to stare at the competition or survive in today's business world [4], [5]. IT is believed to effectively and efficiently improve the performance of a company or organization [6]. In a large or medium-sized and even small companies there is a supply chain that is used in the processes that exist within the company. This supply chain is the distribution contained in the corporate network involved, from upstream to downstream in carrying out activities and processes to produce a value in the form of services that deliver delivery until the final consumer [7].

In the supply chain, today has grown very rapidly by adopting the use of IT. The implementation of IT is considered capable of effective control of the supply chain at present which has been so complex [8]. Fasanghari [9] said that US companies are increasing due to IT implementation. The implementation of IT improves the speed of the supply chain, reducing the processing time to achieve high efficiency in performance[9]. But there are also some researches to say that an IT apprentice needs a large investment and not just anyone so there needs to be good IT governance [9]–[11]. In many cases, the implementation of IT done in many companies only imitate from other companies that first apply to be a failure in implementation [12], [13].

Companies that adopt IT in accordance with needs will have an enormous impact on the competitive advantage or the competitiveness of the company against other companies[12]. SCM implementing IT provides the greatest possibility in developing and gathering a large amount of knowledge on existing customers, suppliers and market demand [14].

The main objective of this research is to explore the success factors gained in the implementation of IT in SCM. Success factor exploration is done by literature review approach of various articles or research that has been done. By providing an overview of the success factors that are gained to give a thrust or picture to other companies to be more motivated in implementing IT.

II. METHODOLOGY

The methodology used in this research is literature review by meta-analysis approach. This approach is an approach that conducts a systematic review of the results of the study [15],[16]. This method can provide an overview of the content of the research by analyzing quantitative results from empirical studies. This method analyzes the results of other studies from various sources related to research, so as to provide an objective view of a study[15],[16]. The process is done by looking for articles related to the implementation of IT on supply chain management. Articles searched on google scholar, ScienceDirect, emerald insight, IEEE explore, Wiley and another. Based on the search obtained 78 articles. The next process by examining the abstract of each article found 26 articles. The final process explores the success factors that exist in the article and identifies the most widely used factors in the article.

III. ANALYSIS

IT that is developed and implemented in the business of industry or companies, especially in the supply chain, has a very significant impact. Implementation of IT in the supply chain can be seen in various studies stating the success factors that have been achieved. Table 1 shows the search results from related articles about this research.

TABLE I. REFERENCE AND FACTOR

No	Year	Succes Factor	Ref
1	2010	Integration,collaboration, Virtual Sc, Community, Usability, Identification , Communication, Cost Knowledge Management	[17]
2	2016	Integrated, Processing, Safety, Quality, Societal, Traceability, Fulfillment, Health-Concerns	[2]
3	2005	Coordination	[18]
4	2015	Transparent, flexible, real-time, ability, visibility, cost-effective, integration, communications, accurate, efficient, Agility	[19]
5	2006	Integrated, Efficiency, Functionality, Decentralized, Communication	[20]
6	2005	Automation and Rationalization	[21]
7	2004	Flexibility, Performance, Suitability, Responsiveness	[22]
8	2006	Direct, Availability, Integration	[23]
9	2015	Efficiency,Effectiveness, Ability	[24]
10	2013	Cooperation, integration, Validity, Relevance, Accuracy, Timeliness, Completeness, Security, Coherence, Accessibility, Compatibility	[6]
11	2009	Effectiveness, Integration, Communication/	[25]

No	Year	Succes Factor	Ref
		Information Flow	
12	2006	Information Exchange, Coordination, Integration, Responsiveness, Activity	[26]
13	2011	Effective And Efficient, Time, Cost, Trust	[27]
14	2015	Efficiency,Transparency,Sustainability	[28]
15	2009	Effective,Speed, Quality,Consequently Communication,Automatic, Efficiency	[29]
16	2013	Performance, Efficiency ,Cost, Effectiveness, Responsiveness	[11]
17	2014	Price/Cost, Quality, Delivery, Innovation, Effectiveness, Profitability,Time To market, Dependability, Product	[3]
18	2018	Effectiveness, Efficiency, Performance, Competitiveness	[30]
19	2005	Efficiency,Quality, Effectiveness, Automation	[10]
20	2014	Time, Automate,Integration, Availability, Efficiency, Timely, Accurate, , Abilities	[4]
21	2007	Transparency, Costs, Significantly, Effective	[31]
22	2007	Costly, Communication, Ability, Coordinate, Monitoring, Reliability, Performance, Times, Accuracy, Completeness, Integration, Speed, Flexible, Relationships, Trust, Long-Term, Quickly And Efficiently	[8]
23	2008	Costly, Communication, Ability, Coordinate, Monitoring, Reliability, Performance, Times, Accuracy, Completeness, Integration, Speed, Flexible, Relationships, Trust, Long-Term, Quickly, Efficiently	[9]
24	2002	Quality And Flexibility, Price, Competitive, Cost Priorities, Efficiency, Time, Quality, Product, Quality, Flexibility, Development, Customer Service	[32]
25	2014	Integratation And Effective, Effcient, Effective,Time	[33]

With meta-analysis mapping from 25 references in research finding 56 success factor from implementation IT. From all success factor did mapping by author finds 21 mostly success factor. This factor is Efficient, Integration, Cost, Effectiveness, Communication, Ability, Timeliness, Accurate, Accurate, Performance, Coordination, Flexible, Automation, Quality, Transparent, Real-Time, Responsiveness, Trust, Speed, Completeness, Relationships, Suitability. Can be seen complete in figure 1.

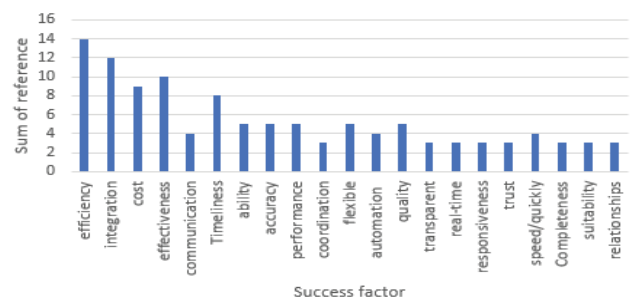


Fig. 1. Most import success factor by reference

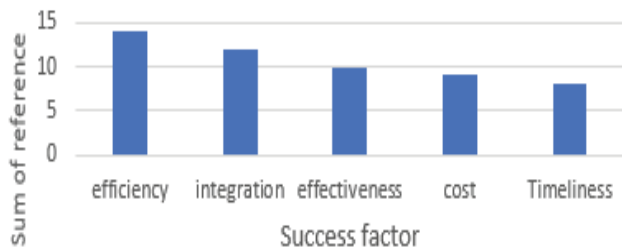


Fig. 2. Five Mostly of Succes Factor by reference

These five factors are very influential factors after implementing IT in the supply chain. The factors of efficiency, integration, cost, timeless greatly affect all performance and processes in the supply chain. Efficiency factors can be influenced by a good IT integration process so as to provide speed in carrying out the timeless process which then affects the costs of all existing processes.

A. Success factor in implementation IT in supply chain management.

1) Efficiency

In the company strongly supports the efficiency of all processes carried out in the supply chain, among others, the efficiency of the process of getting an information is needed to run their business with the support of IT properly [19], [20], [24]. Systematic information sharing in organizations requires strategies and commitments to be efficiently useful in all supply chain networks to support all of the company's business strategies [3], [11], [29]. The importance of information in the company requires timely information and speed can improve the quality of decision making [9], [31], [32].

2) Integration

The conceptualization of a company in coordinating all strategic activities such as planning, forecasting to take a decision in supply demand in supply chain activities requires the integration of good technology [2], [9], [17], [19], [20]. With good IT integration, it will have an enormous impact on supply chain performance [5], [6], [25], [26].

3) Cost

IT Implementation is a way to reduce transaction costs that occur in all the supply chain strategic activities in the company [3], [17], [19], [28], [30]. IT can provide fast and timely transactions so as to efficiently reduce supply and management. In addition, increased cost control, reduced administrative costs and better manpower planning [8], [9], [31], [32].

4) Effectiveness

The Company considers an efficient business strategy using IT to ensure the effectiveness of integrated supply chain and strategic activities with supplier participation [5], [24], [25], intermediaries and market needs. Effects of collaborative interaction / information technology decision support to improve supply effectiveness and customer integration [10], [11], [30], [33].

5) Communication

In business activities are in need of skills in effective and efficient communication. IT supports the development of online communication using the internet [9], [17], [19], [20]. this communication can connect between company and customer. In addition, timely communication can also easily control the supply chain, so as to make an appropriate and efficient decision [11], [25]. All of this illustrates the evolution that takes place within the supply chain to the online business community. The benefits of all this underscore the importance of IT in SCM that can enhance cooperation and integrate information well [9], [31].

6) Ability

The development of IT affects the ability of its intelligence to perform tasks or actions to obtain relevant information from buyers, monitors and surveillance, or others [19] [23], [24]. IT provides the ability to integrate all the needs that exist in the supply chain [5], [9], [32].

7) Timeliness

Strong IT links to supply chains provide timely interaction in all activities [6], [28], [30]. IT provides timely information on supply chain activities in terms of production time, faster delivery [9], [31]. Anything can right provide an advantage in cost reduction in supply chain activities [30], [32].

8) Accuracy

IT supports information that is a reality, timely, accurate is very important because the accuracy of information determines the quality of the information conveyed [6], [19], [27]. The accuracy of the information will also provide the speed of information transferred to all relevant parties in a timely manner [5], [9], [32].

9) Performance

Performance of a company can depend on IT implementation [10], [34]. IT provides revolutionary companies in performing their performance so that good IT management according to company needs can improve supply chain strategically, because where the supply chain is used as a means to improve company performance so that it can be more competitive [3], [9]. The implementation of IT in SCM allows companies to develop and collect knowledge of customers, suppliers, and market demand, thereby affecting the performance of the company [9], [32].

10) Coordination

IT Implication in the supply chain aims to enhance cooperation or performance coordination [18], [26], [32]. Coordination that occurs in all activities provides many advantages in improving company performance in competing [9], [32].

11) Flexibility

Flexibility in making decisions will support the creative process of performance that goes on the supply chain [19], [32]. It requires a good confirmation of IT so that flexibility can provide a high quality of information so as to benefit each other [9], [19]. IT plays an important role in streamlining the performance of supply chain in the company [9], [31].

12) Automation

The widespread adoption of IT in various processes in supply chains such as manufacturing, planning, and product development [10], [11]. IT can help automate all those processes. It also can provide superior information to the decision makers automatically and appropriately so as to provide efficiency and speed of performance process [4], [35]. Automation is generated by applying a good IT and according to the needs of the company thereby making the company optimistically competitive [10], [35].

13) Quality

In the implementation of IT in the supply chain is an advantage in sharing information so that it can balance every activity on the network [11], [30]. Thus IT in the supply chain has many benefits from upstream to downstream of the supply chain process so that by itself improves the quality of each process of activity for the better [4]. This increase provides a highly competitive advantage for the company [31].

14) Transparent

IT has become one of the keys to creating transparency within the company, especially the information that is needed by the company [19], [36]. IT provides a direct process in the delivery or exchange of information to those in need, it indirectly creates the transparency of the process of performance in the company [19]. Thus sharing information occurs systematically involving the right parties and improving the quality of the company [28].

15) Real-Time

In the supply chain data and information exchange in real-time is a very important prerequisite in the environmental management system performance [22]. It can only be facilitated by the IT process effectively and efficiently so as to protect all processes in the supply chain [36]. This facility in ordinary IT can be a Web-based medium [19].

16) Responsiveness

In conducting competition within the global marketplace, companies must have a quick and good response in performing more competitive performance in handling consumer demand in an ever-changing marketplace [3], [22]. IT here plays an important role because it establishes a network that is used to communicate with each other quickly and well [11], thus increasing the responsiveness of a company.

17) Trust

Trust in organizational relations plays an important role. Where trust is built on the relationships of related partners [37]. With IT-facilitated levels of trust will be able to increase rapidly, because IT can provide important or valuable information that is needed by these partners [8], [9]. The IT role allows for accurate calculation and real-time tracking of what partners need [9], [37]. All of these roles will help from the competitive advantage of the company.

18) Speed

Companies desperately need good, correct, speed and timely information management, it is necessary for corporate decision making [8], [9]. Therefore, the implementation of IT

in the supply chain is very supportive and accelerate all business strategies within the company, because IT can integrate well with each other [3], [29].

19) Completeness

The completeness provided is important in the supply chain, for example, information [8], [9]. IT developers have become a concept that supports the completeness of the provision of information in order to make the process, which has an impact on the increasing wealth of more interactive communication between companies and customers [6], [8].

20) Suitability

The role of IT in the supply chain is one of providing the suitability of a process of activity [6], [22]. One of IT's role is to provide compatibility of information that has been integrated into the supply chain system [6]. The role provides an improvement in the performance of the company's business, thus maintaining the sustainability of a company in the global business competition [28].

21) Relationships

Relationships are a very important thing to build in business. The relationship itself occurs in every partner present in the business [8], [9]. Companies are required to maintain such links to facilitate activities within the supply chain [26]. With IT, the relationship can be established with a communication system built online so that it can be fast, real-time, good and especially fast. Thus, it increases the trust of the relevant partners in the business that impact the sustainability of a company [8], [9].

IV. CONCLUSION

The results of the study were carried out with a review of the literature in various articles published in various journals and conferences searched in various databases of reputable journals. This study with the meta-analysis approach to found 56 successful factors from the implementation of IT in supply chain management. Of the 56 success factors after further analysis with many authors discussing with at least 3 authors, 21 were found to be very successful influencing factors from IT, among others: Efficient, Integration, Cost, Effectiveness, Communication, Ability, Timeliness, Accurate, Accurate, Performance, Coordination, Flexible, Automation, Quality, Transparent, Real-Time, Responsiveness, Trust, Speed, Completeness, Relationships, Suitability. This factor is a success factor derived from the implementation of IT in the supply chain. This research gives a view to all companies that intend to implement IT in the supply chain. The application of IT has a positive influence on all supply chain activities so it can improve the processes that occur within the company from purchasing raw materials, production processes, logistics, customer service. All this gives the opportunity for a company to compete globally with others.

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