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LOGISTICS INDUSTRY IN THE ARAB WORLD: THREATS AND OPPORTUNITIES
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**GLOBAL SUPPLY CHAIN GROWTH OPPORTUNITIES USING
THINKING PROCESS**

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ABSTRACT

Thinking Supply Chain Approach (TSC) is recently developed as one way to reduce supply chain costs and it offers an opportunity to identify ways to address the cost-decreasing impact. This approach could help design trade agreements that are more relevant for businesses while increasing incentives for investors. This paper aims to address a series of tools and instruments that facilitate trade using TSC and it proposes a Thinking Process Framework that could support global supply chain growth.

KEYWORDS

Thinking process, supply chain innovation, global supply chain, value chain

1- INTRODUCTION

In the last two decades, the total value of global trade has increased by US\$ 20 trillion. This has led to innovate in logistics and supply chain for the purpose of reducing the costs of shipping goods and services across borders. Global supply chain and value chains became more indispensable feature of global commerce. And, the focus of international supply networks is to generate operation of global value networks and on the identification of initiatives that could be pursued to improve the operation of the global logistics industry. The efficiency of logistics-related industries is based on global supply chain growth.

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Different opportunities for global supply chain growth can be attained by removing policies that create supply chain barriers, delays and associated uncertainty. Also, Austerity measures would reduce global supply chain barriers, improving border management, and have a positive impact other possible initiatives for lowering the tax burden on global trade.

2- METHODOLOGY/APPROACH

Exploratory approach was conducted in this paper to help understanding the research problem and providing significant insights into a given situation. It relies on secondary research such as reviewing available literature, qualitative approach and projective methods. This approach helps build strength around the linkage between thinking process elements, metrics, best practices and opportunities for global supply chain growth.

3- ORIGINAL/VALUE OF PAPER

The degree if risks are increasing in synchronization with global supply chain growth. Raising threats of attacks to global supply chain network requires a reliable thinking approach to display new opportunities for improving global supply chain performance. This paper aims to identify a series of tools and instruments that support global supply chain growth using a “Thinking Supply Chain Approach”.

4- Review of Relevant Literature

Over the last decades, different systems thinking approaches are incorporated into supply chain design decisions, such as the ‘The Theory of Constraints (TOC)’. Thinking approaches shall efficiently help design and manage supply chain systems and their drivers. TOC was developed as Optimized Production Technology, and then it was extended to overall theory for running an organization.

TOC consists of five focusing steps. First, it aims to identify both physical and managerial constraints that affect the organization’s goals. Second, it focuses on eliminating previous constraints. Third, TOC is working to utilize efficiently the available resources. Fourth, it enhances the improvement of overall system performance. Fifth, TOC is a continuous improvement process to identify any new constraint. In 1994, Goldratt developed a ‘Thinking Process’ (TP) that helps further to identify policy constraints. Rahman (2002) highlighted that TOC has two major components; including ‘Logistics Paradigm’ and ‘Thinking Process’.

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Also, a ‘Thinking Process’ (TP) approach was developed and applied to identify critical factors that influence a global supply chain growth. TP deals with three generic questions when go globally as illustrated in Table 1.

Table 1- Thinking Process Tools

Generic Questions	Purpose	TP Tools
What to change?	Identify core problems	Current Reality Tree (CRT)
What to change to?	Develop simple, practical solutions	Evaporation Cloud (EC) Future Reality Tree (FRT)
How to cause the change?	Implement solutions	Prerequisite Tree (PRT) Transition Tee (TT)

Source: Rahman (2002), P. 812.

Question one deals with identify the problem facing supply chain on a global market. The second question states potential solutions. The third question identifies the obstacles of implementations and how to implement the proposed solutions. In order to be able to answer these questions TP identifies five standardized tools helping in answering each question. These tools and their relations were explicitly illustrated by Tulasi and Rao (2012).

TP is a continuous process in which problems are formulated, solutions are proposed and a plan to perform the reached solutions is set, as shown in Figure 1. In this paper, the researchers propose that the TP is a two phase framework to reach a detailed plan to improve the current status using the five aforementioned tools. If the decision maker wants to introduce change to the current status he/she should analyze the current status systematically in order to develop change ideas to be proposed. In this phase, the answer of the first and the second questions is reached using the CRT, EC and FRT. In addition to that and at the completion of this phase, the actions needed to implement the proposed change are defined.

In the second phase the planning for change implementation is done by trying to discover what the possible conflicts, obstacles are and what else will be affected by the proposed change and set the plans to avoid these harmful effects of change. Then a detailed plan for implementation actions is set. In the following section the TP tools will be defined and illustrated.

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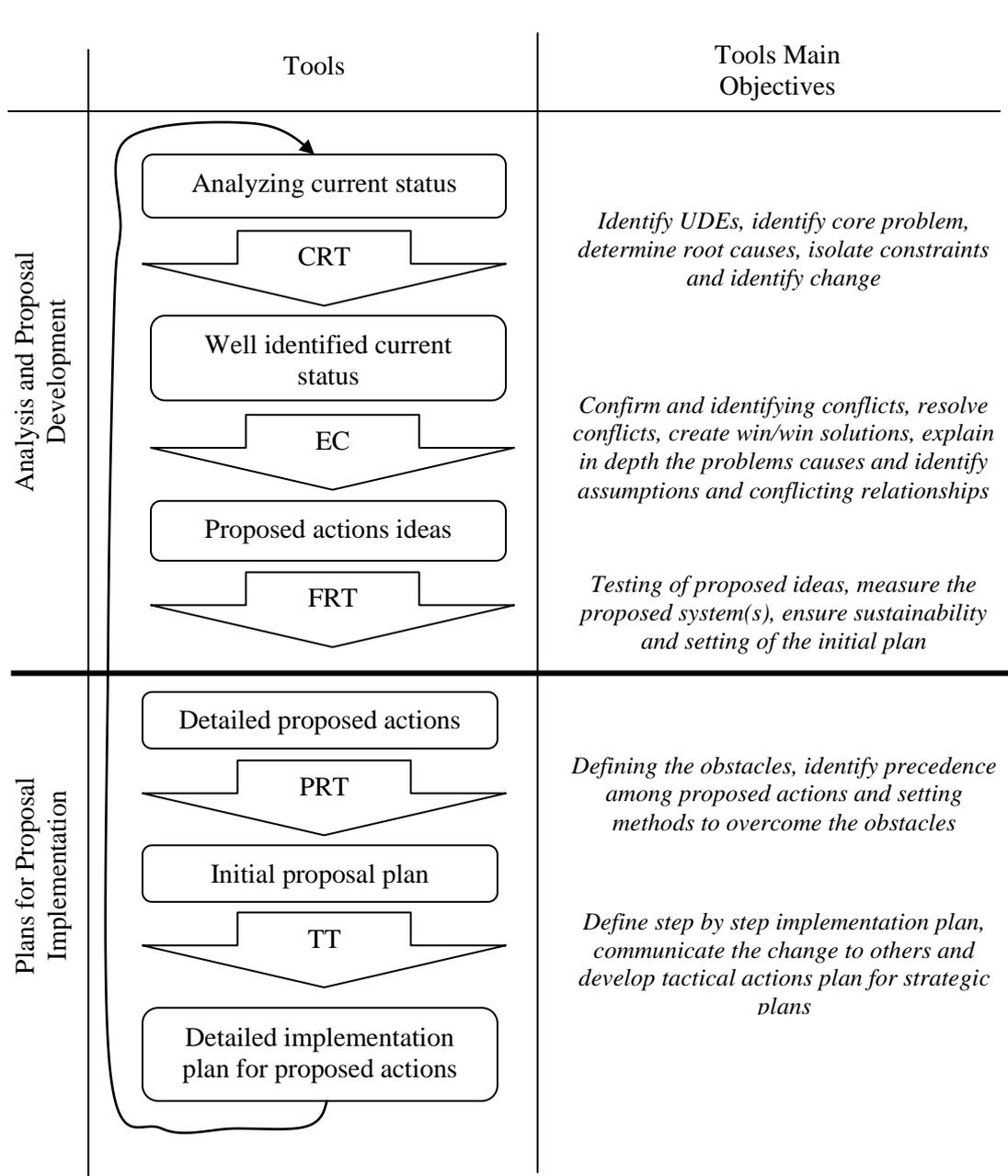


Figure 1- Proposed Thinking Process Framework

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5- Thinking Process (TP) tools

5.1. Current Reality Tree (CRT)

It can be considered as the tree form of the cause and effect diagram with more elaborated objectives. While building the CRT, a definition of the undesirable effects (UDEs) of the current status and their root causes will be made. Also, the current status constraints are identified and isolated. By the completion of the CRT at least one simple change is proposed.

5.2. Evaporating Clouds (EC)

EC is designed of five standard boxes as shown in Figure 2. While building EC, all conflicts are defined and resolving them can be done. A better visualization of the conflict will allow proposing better solutions where win/win situation is reached and explain the depth of the problem and identify the status and conflicts assumptions.

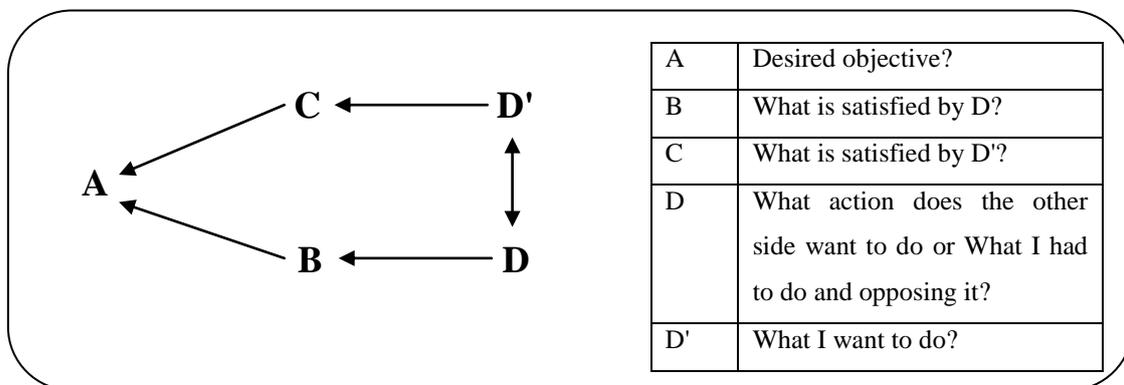


Figure 2- Standard format of the EC

5.3. Future Reality Tree (FRT)

The FRT can be viewed as a replica of the CRT performed on the future state (or desired to reach status). The same tree like structure is developed in order to discover any problems or new UDE in the future status and to measure the impact of proposed change and whether the proposed change will achieve its objectives.

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5.4. Prerequisite tree (PRT)

In this tree all obstacles are defined and their relations to change objectives are clarified. This enables the setting of counter measures to these obstacles. Also, the milestones of changes implementation is defined which enables the identification of the precedence among the change actions.

5.5. Transition Trees (TT)

In the TT, the objections and actions to achieve change are related. Also, measuring the proposed changes impact and whether they yield the expected results or not. As a result of developing the TT, a detailed implementation plan is formulated.

Other approaches were also developed to reduce manufacturing costs in supply chains, increasing profitability and competing globally; including Materials Requirements Planning (MRP I, MRP II) (Orlicky, 1975), Just-in-Time (Monden, 1981), Total Quality Management (TQM) (Juran, 1992), Lean Manufacturing (Womack & Jones, 1996), and Theory of Constraints (TOC) (Goldratt, 1988). Any Thinking approach is simply a management philosophy that is used in managing systems from strategic level to operational level (Bashiri & Tabrizi, 2010).

6- Thinking Supply Chain (TSC) Approach using TP

In global markets, organizations face higher customer expectations, complicated information networks, high wage-rates and improved transportation. This requires organizations to have a competitive advantage to face global competition and uncertainty. In this such environment, the purpose of supply chain management must be to minimise costs, improve responsiveness and increase effectiveness.

Thinking Supply Chain (TSC) approach is developed in this paper to identify the causal relationships between elements through the entire supply chain. TSC is an integration of the TP, as discussed earlier, and some basic paradigms used traditionally in SCM. Such paradigms were indicated selected by Rahman (2002) in his trail to develop SC strategies using TOC, which are:

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- Supply base management
- Sharing information
- Trust
- Long-term partnership
- Environmental policy
- Coordination
- Supply chain wide performance measures
- Investment

Moon and Kim (2005) claimed that managing supply chains efficiently requires understanding of managing dynamics in the chain that have been identified in terms of rational and irrational factors. They discussed how individual systems thinking ability, of supply chain participants, impacted on the dynamics of the total supply chain, that is, the “bullwhip effect”. Ignorance of supply line, price fluctuations, shortage gaming, order batching, independent forecasting and information distortion are some causes of “bullwhip effect”.

Systems thinking ability can be an instrument to measure an individual ability, which is expected to impact on supply chain management. Thinking ability, such as TP, TOC and TSC, is the potential means of controlling, influencing, and appreciating the parameters, which are affecting the system’s existence. The focus of thinking ability is made regarding the level of consistency related to uncertainty and complexity, which are considered as global supply chain characteristics.

‘Supply Chain Innovation (SCI)’ Approach is recently developed as an opportunity for global supply growth (Arlbjorn et al., 2011). SCI is defined as “a change (incremental or radical) within the supply chain network, supply chain technology, or supply chain processes (or combinations of these) that can take place in a company function, within a company, in an industry or in a supply chain in order to enhance new value creation for the stakeholder” (Arlbjorn et al., 2011, p.8)

The main purposes of SCI are to improve the performance of supply chain, to develop technological activities through the entire supply chain, to apply information technology (IT) as an important driver for innovation such as radio frequency identification technology (RFID), and to describe the measurement of innovation performance in terms of the performance of the product development process (R&D process).

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On a global scale, SCI approach has several characteristics. SCI is dynamic in nature because of a change process, it may range from incremental to radical in terms of its innovation effect, it can take place within different business functions, and the innovations must encompass new value creation, such as new markets, new products, new services, and new network structures. Table 2 displays examples of SCI elements.

Table 2- Examples of Supply Chain Innovation Elements

Supply Chain Business Process	Supply Chain Technology	Supply Chain Network Structure
Demand management	Business intelligence	Collaboration
Order fulfillment	Advanced planning system (APS)	Distribution channels
Product development	Manufacturing execution system (MES)	3PL
Return management	Enterprise resource planning (ERP)	4PL
	Product-life-cycle management (PLM)	SC joint ventures

In order to integrate the TP with different SCM paradigms the first the level of intended change should be determined, whether it is on the macro or micro level. Macro level changes such as global strategies, SC relations, SCI, and driving SC performance. While the micro level such as SC tactics and operations, and SC coordination. In Global supply chains macro changes will have priority especially when the enriching their growth opportunities is objective.

Before using the TP developed framework in proposing global SC growth opportunities, a wide area of knowledge about the SC and global economies must be known. These areas are (but not limited):

- SC strategic objectives.
- SC structure.
- SC current risk management program.
- Economic indices of different countries hosting the SC operations.
- Future economic plans of the different countries hosting the SC.
- Regional Trade agreements.

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7- Global Growth Opportunities

Increasing global competition, increasing flexible structures of manufacturing, increased levels of global outsourcing, collaborative networked organizations, and high levels of uncertainties and, above all, customers located around the world, who are demanding higher levels of service (Bowersox et al., 2007, p. 29).

Global competition requires integration on a global scale as a prerequisite to supply chain excellence (Christopher, 1998; Lee, 2000). Integration is one of the opportunities for global supply chain growth. Other opportunities include; power position in the supply chain (Cox, 2001), purchasing integration (Narasimhan and Das, 2001), simplified material flows (Childerhouse and Towill, 2003), and shared resources (van Donk and van der Vaart, 2005).

For other supply chain growth opportunities, companies should sell very short life cycle products that received quantity discounts (Patil et al. in press). Hence, there is a need from those companies to decide the end of the season markdowns by studying sales pattern. Also, the conventional strategy of placing and transporting a single large order can become a better option for global growth.

Another opportunity for achieving supply chain excellence on a global scale is concerning about how buying organizations can configure their supply networks to achieve supply chain flexibility. Supplier can play an essential role as supply network coordinators to provide two key antecedents of flexibility: sourcing and vendor flexibility. The purpose is to provide different categories of suppliers, such as framework agreement suppliers, preferred suppliers and approved suppliers, each to maintain a suitable level of supply chain flexibility.

Global supply chain management, concerning environmental and sustainability issues that further impact the global supply chain, is another opportunity for global growth. Factors affecting freight transport demand, truck fuel consumption and related CO2 emissions should be critically managed.

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Prajogo and Sohal (2012) focused on the need for supply chain professionals to transform from a more transactional and clerical task orientation to a planning and strategic task orientation on a global scale. They highlighted that the changes required by supply chain members are to move from a reactive mode to a planning mode, from risk avoidance to risk management, from hoarding information to sharing information, from transactional relationships to managerial relationships, from bureaucratic behavior to creative behavior, and being a team decision-making involving all supply chain members.

Greater visibility requirements of supply chain, lead time compression (end-to-end supply chain pipeline), and integrating processes with supply chain partners are identified in this paper as opportunities for global supply chains growth. The concept of integrated logistics has changed the view of competition; from between individual firms to between supply chain networks which reflects a broader view of operations from intra-firm level to inter-firm level.

8- CONCLUSION

Continuing challenges for global supply chain required managers to focus on supply chain velocity, emerging market production, managing potential opportunities and risk and complexities. Different thinking approaches are widely applied in the management of total costs across the global supply chains. A Thinking Approach was recently developed to bring a product to market utilizing all the available resources and aligning activities with the organization's strategies and objectives.

Thinking Supply Chain (TSC) and Thinking Process (TP) approaches were, in this paper, discussed and identifying critical factors that influence a global supply chain growth. In this paper, a Thinking Process Framework is explained, different TP tools and instruments are discussed, and opportunities for global supply chain growth are addressed, such as Supply Chain Innovation (SCI) Approach.

Applying the proposed Thinking Process Framework in this paper for certain industries, imports and exports in Egypt is insight for future work. This would help to identify the obstacles facing supply chains in Egyptian market when calling globally.

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