

The Future Effects on Supply Chain of Watch Parts Manufacturing in Thailand Industry for Exporting

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ABSTRACT

This research focuses on the global change of the supply chain of watch parts manufacturing for exporting from Thailand to Switzerland. Swiss watch industry is the biggest of watchmaking and watches parts in the world. Thailand is 18th country, exporting to Switzerland and watches and watch parts are 2nd of all product group. The research questions are associated with customers, technology, market, business change, and how to watch part manufacturing in Thailand industry could be managed and adapted appropriately for the future. The methodologies consist of analyzing and synthesizing all data of watch parts manufacturing, which may affect the global and local supply chain. The results rank all effectiveness factors and propose the appropriate solution for Thailand industry of watch parts manufacturing for export.

Keywords: Supply Chain, Future Affects, Watch Parts Manufacturing

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Introduction

There are many trends and megatrend in the future of supply chains 2025, which is on the forces of change that will reshape supply chains from today to 2025 and make recommendations for how companies can develop their supply chains to fit for the future. This primer provides a new way of thinking about the future of supply chain by bringing together the top procurement priorities of leading global businesses and the key forces of change reshaping the very business models that have given rise to global supply chain to enable supply chain leaders to envision and manage future fit supply chain. Both sets of drivers and their potential implications for supply chain create a powerful lens through which to reimagine the ways that all parties to global supply chain create value and contribute to a more just and sustainable world. Supply chain leaders, and the organizations with which they work, should seize this moment of significant change to design and implement new supply chain management models to serve consumers in a sustainable way.

Disruptive technology and innovations are currently changing the platform of many industries and their business models. Because of increasingly digitalized processes and an exponential growth of sensible data, supply chains are also impacted by the fourth industrial revolution. The various

technologies used in logistics and supply chain management including information technology, communication technology, and automatic identification technology. The strategic management requires a more transparent understanding of the currently available and interrelated technologies and concepts. Since the supply chain will obviously undergo an organizational change, a theoretical framework is necessary to understand which activity is impacted by a holistic management-perspective. Moreover, the impact of technology and innovations also change on future infrastructure supply and demand such as reduce the need to build a new supply, create of additional demand, lower the cost of supplying and lead to more vulnerable infrastructure systems. (National Infrastructure Commission, 2017)

The watches are one of the products that will be affected by changes in the future because many factors are radically changed in the business model and business platform. Switzerland is one of the leaders in exports of high-end watches as well as clocks. Swiss watchmaking companies produce most of the world's high-end watches. Swiss movement manufacturer ETA SA (Swatch Group) has been developing and producing calibres for the watch industry since 1793. This expertise laid the foundations for the emergence of one of the world's largest

manufacturers of watches and movements, ETA SA. Moreover, ETA SA has over 15 production sites in Switzerland, Germany, France, Thailand Malaysia and China. Part of the Swatch Group has redesigned the distribution of spare parts to brand manufacturers by pursuing an integrated approach to Electronic Commerce (EC) and Supply Chain Management (SCM). These are fundamental strategic concepts when businesses are forging links with their suppliers and customers. Most of the watch parts are produced by distributing to an Asian country. Thailand is one of watch parts manufacturers for exporting to Switzerland. Thailand is ranking 18th exporting to Switzerland and watches and watch parts are 2nd of all product groups because ETA SA (Swatch Group) is the biggest of investment with the watch parts sector in Thailand industry. The trend of the watch parts exporting of Thailand industry to Swiss is, on average, decreasing about 5.8% since 2012-2017 ([www. http://tradereport.moc.go.th/](http://tradereport.moc.go.th/)). The major results come from global supply chain changes, such as digitalization, automatization, transparency, mobility, modularization, etc.

The research question is focused on the problem of future effect on supply chain of watch parts manufacturing in Thailand industry for exporting to Swiss. The aim of

this research is to find the factors effect and then strategies suggestion for watch parts manufacturing of Thailand industry. By using previous researches, the related researches have been investigated, analysed and synthesized with all information and factors effect of watch parts manufacturing, the results of which are the factors effects and strategies suggestion.

Literature Review

Since the middle of the 20th century, logistics has come to be accepted in the business sector. Today, Supply Chain Management may be described as the integrated management approach for planning and controlling the flow of material from suppliers through the distribution channel to the end user. Compared to the internal focus of traditional logistics approaches, supply chain management emphasized the management of upstream and downstream relationships and the role of supply chain optimization in increasing customer value at less cost. (Christopher, 1998) There are several approaches for supply chain management such as Just In Time (JIT), Zero Inventory (ZI), Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI) or Continuous Replenishment (CR). (Klaus, 1998) This involves three areas including 1) Order processing activities

originating at the customer 2) Material activities of supply chain directed towards the customer 3) Order-related financial activities. Various models have been put forward by software vendors and industrial organizations for modelling supply chains. A well-established one is the supply chain operations reference model (SCOR) proposed by the Supply Chain Council, an American industrial association. These processes are addressed by individual organizations and linked up in inter-organizational scenarios. The inter-organizational aspect is reflected in two areas: First, source and deliver activities are located at the interface of internal and external organization units. Second, SCOR envisages a planning hierarchy, i.e. the planning in two organizations can be linked via an additional planning activity, which oversees and coordinates the individual plans.

ETA (Euskadi Ta Askatasuna) has started the business network redesign project since 1996, there were three main problems that were considered to be of strategic importance: 1) redesign of the introduction process for new movements, 2) A new distribution strategy for movements and spare parts as well as, 3) The installation of a new distribution channel for spare parts and movements.(Hubert et al., 2000) In order to ensure customer-oriented and efficient production of watches, a coherent

management of the relationships among the relevant group companies is one key success factor by using Business Network Redesign (BNR). There are two phases of implementing: 1) BNR I: Distribution of Spare Parts 2) BNR II: Electronic Commerce (EC) Solution. Effective supply chain management has become an emergent strategy for Thai manufacturers to secure competitive advantage and improve organizational performance in today's highly volatile global market. The significant positive is related to the eight supply chain management characteristics, which firms need to develop and implement effectively in order to maximize organizational performance. In supply chain of Thailand product champion of passenger car tire industry, forecasting for future productivity is also capacity balance and future location of the chain is the major problem. It was found that demand uncertainty and quality uncertainty affect the risk perception of purchasing managers. Thailand's flooding, which the supply chain disruptions are translated into production and export performance, and explores how companies can effectively manage the risks and cope with supply chain breakdowns. Thailand industry is also found that the total quality management (TQM) impact on supply chain management, which need higher quality of business as demand future changing. Moreover, there are several

researchers about the influence of green supply chain management in electronic and auto parts industry in Thailand.

Research Methodology and Approach

The paper reviews describe the change in the future of global supply chain and also local network supply chain of Thailand industry. But, it's rarely referred to watch part manufacturing, especially in Thailand industry. This research aims to identify, analyze and evaluate respectively. A qualitative technique has been applied to this study. An in-depth interview (senior managers in the watch parts manufacturing) was used to identify the future effects on the supply chain of the watch parts

manufacturing in Thailand industry for exporting. The factors effect consists of all networks of the supply chain of the watch parts manufacturing. Then factors ranking and filtering technique have been applied for evaluation. All factors are evaluated by applying the Failure Mode Effects Analysis (FMEA) methodology(Lorenza Erright, 2017). Some of the factor control strategies have been suggested consequently in order to minimize the significant impacts. The research framework is shown in Figure 1. The researchers analysis with all literature reviews and one expertise interviews can identify 25 factors consist of the supply chain of the watch parts manufacturing in Thailand industry as shown in Table 1

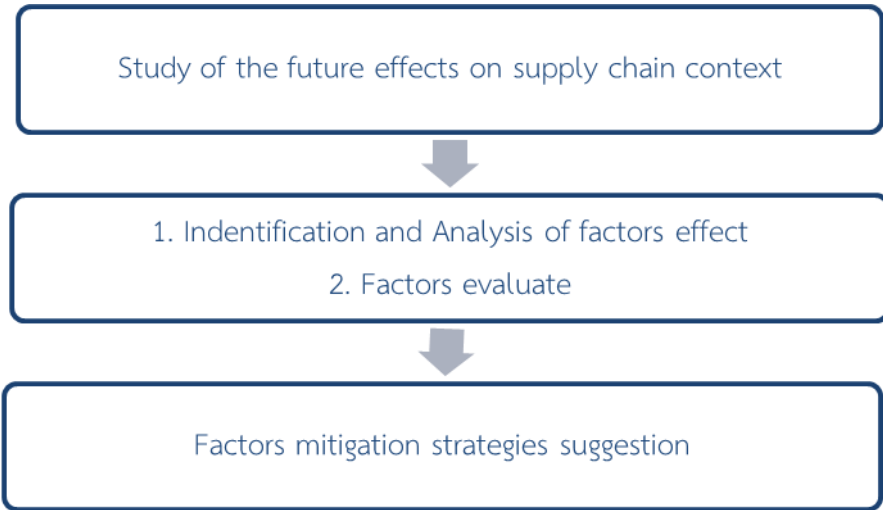


Figure 1 Research Framework

Table 1 Analysis of Factors affect list of reviews and specialists

Technology & Digital Change [5,6, 7,8,13,14]	Environment Change [18, 19,21, 22, 23, 24].
1) Digitalization 2) Automatization 3) Real-time availability	13) Green 14) Disasters 15) Socialization
Operations Change [11, 13, 15,17]	Management and Policy Change [5, 9, 13, 16,17,20]
4) Procurement 5) Transportation 6) Manufacturing 7) Reverse logistics 8) Eco-design 9) Inventory and Warehouse 10)Flexibility	16) Total Quality Management 17) Demand 18) Raw Materials 19) Competitors 20) Transparency 21) Dynamics Degree of Integration 22) Network-Collaboration 23) Decentral Controlling 24) Modularization
Human Resource Change [25]	Financial Change [10]
11)Labour 12)Knowledge	25) Cost and Price

$$R_n = P_n \times S_n \quad (1)$$

Evaluation and Results

Those factors have been evaluated to effect by applying FMEA and ranking method to quantify the probability and consequence of a two-dimensional, a basic evaluation model. The scores are assigned as high (H), medium (M) and low (L) effects. For both probability of effect occurrence, the severity of consequences. The effect priority number (R_n) is given by multiple of probability (P_n , rank 1-10) and severity (S_n , rank 1-10) as shown in formula (1).

The results are suggested with four basic strategies used to manage change in and to organizations :

- 1)Empirical-Rational (E-R)
- 2)Normative-Reeducative (N-R)
- 3)Power-Coercive (P-C)
- 4)Environmental-Adaptive (E-A)

The factors ranking and evaluation have been presented in Table 2 with three levels of risk priority number are High (H: Greater than equal 80), Medium (M: Greater than equal 70 and less than 80) and Low (L: Less than 70). And then these

results are evaluated by 4 experts who are
1) senior managers in the watch parts
manufacturing 2) supply chain and

logistics experts 3) economist experts and
4) technology and innovation experts

. Table 2 The factors ranking and evaluation

Change Events	Factors	P_n	S_n	R_n	Eva.	Strategies
Technology & Digital	1) Digitalization	10	10	100	H	(E-A)
	2) Automatization	10	9	90	H	(N-R)
	3) Real-time availability	9	10	90	H	(N-R)
Operations	4) Procurement	8	10	80	H	(N-R)
	5) Transportation & Distribution	9	10	90	H	(N-R)
	6) Manufacturing	8	8	64	L	(N-R)
	7) Reverse logistics	8	7	56	L	(E-A)
	8) Eco-design	9	9	81	H	(E-A)
	9) Inventory and Warehouse	9	9	81	H	(N-R)
	10) Flexibility	8	8	64	L	(N-R)
Human Resource	11) Labour	9	9	81	H	(E-R)
	12) Knowledge	8	10	80	H	(N-R)
Environment	13) Green	7	8	56	L	(P-C)
	14) Disasters	7	10	70	M	(P-C)
	15) Socialization	8	10	80	H	(E-A)
Management and Policy	16) Total Quality Management	7	7	49	L	(N-R)
	17) Demand	8	9	72	M	(N-R)
	18) Raw Materials	8	10	80	H	(N-R)
	19) Competitors	7	10	70	M	(E-A)
	20) Transparency	8	8	64	L	(P-C)
	21) Dynamics Degree of Integration	9	9	81	H	(N-R)
	22) Network-Collaboration					
	23) Decentral Controlling	10	10	100	H	(N-R)
	24) Modularization	7	8	64	L	(N-R)
Financial		8	8	64	L	(N-R)
	25) Cost and Price	9	9	81	H	(N-R)

Conclusion

In this study, the future effects on the supply chain of the watch parts manufacturing in Thailand industry for exporting have been reviewed by all researchers and one expert interview,

which are associated with the impact on the future supply chain. It was revealed that basically 25 factors are affected by the supply chain. The FMEA and ranking method are applied for evaluating and then the strategy is suggested to change

management. The results are all change events showing at least one with high level significant (H) including digitalization, automatization, real-time availability, procurement, transportation and distribution, eco-design, inventory and warehouse, labor, knowledge,

socialization, raw materials, dynamics degree of integration, network-collaboration and cost and price. Besides each factor, effects are suggested with four mitigation strategies for the watch parts manufacturing in Thailand industry.

References

- Christopher, Martin (1998), **Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service**, 2nd edition. Great Britain: Financial Times / Prentice Hall.
- Christian Reichmayr, Rainer Alt, and Elgar Fleisch (1999), “ Business Network Redesign: Reorganization of Distributed Process in Medium-sized and Large Companies” **INFORMATIK/INFORMATIQUE**, 5 (October). 36-37.
- Hubert Osterle, Elgar Fleisch, and Rainer Alt (2000). Business Networking: Shaping Enterprise Relationships on the Internet. **Springer-Verlag Berlin Heidelberg**. pp 128-140
- Klaus, P., Klaus, P., Krieger, W. (Eds.), **Supply Chain Management in Gabler Lexikon Logistik, Gabler**, Wiesbaden, 1998, p. 285,436.
- Lorenza Errighi and Charles Bodwell (2017). Electrical and electronics manufacturing in Thailand: Exploring challenges and good practices in the workplace, **International Labor Organization**, ILO Asia-Pacific Working Paper Series.
- National Infrastructure Commission (2017). **The Impact of Technological Change on Future Infrastructure Supply and Demand**. Retrieved from https://www.nic.org.uk/wp-content/uploads/2905991-NIC-TECHNICAL-v0_5-ACCESSIBLE.pdf