

CROSS CULTURAL LOGISTICS AND SUPPLY CHAIN MANAGEMENT TOWARDS ORGANIZATIONAL EFFECTIVENESS WITHIN THE ASEAN/THAI AUTOMOTIVE INDUSTRIES: A SEM ANALYSIS

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ABSTRACT

As a manufacturing, logistics and supply chain hub within ASEAN (Association of Southeast Asian Nations), Thailand holds the 12th spot in global vehicle production for an estimated 2,355 Thai and multinational automotive industry enterprises. Within the Association of Southeast Asian Nations, Thailand ranks number one in automotive production contributing \$US11.4 billion to the Thai economy and 12 percent to Thailand's GDP (Gross Domestic Product), with the automotive industry being Thailand's leading export sector. However, the automotive companies envisage the difficulty of cultural diversity to manage and coordinate. Therefore, cultural values from the milieu are inducted into the workplace and have a strong impact on both individual behavior and organizational effectiveness and must be direction at all levels for cross-cultural, organizational effectiveness to be achieved. It also became evident that natural disasters are frequent and highly disruptive to the global automotive supply chain and paces must be taken to countervailing the notable and continuing loss to economic growth and organizational effectiveness to both sector units and the global industry. The implementation of strategically placed, environmentally 'habituated', automotive parts logistics cache might be one solution to the problem. Given the crucial importance of this sector to the economy of the region and the global supply chain, the researchers surveyed 220 managers using a 7-point Likert scale questionnaire within the multinational industrial clusters of Thailand's 'Detroit of Asia' Eastern Seaboard region. Using Structural Equation Modelling to test the 11 variables on Logistics Management, Supply Chain Management and Organizational Effectiveness in a cross-cultural context, it was determined that collaboration within the supply chain and the exchange of information can reduce uncertainty, with trust being a key ingredient to a JV's success. Communication (0.836), trust (0.834) and collaboration (0.824) were ranked as significant components of cross-cultural Supply Chain Management effectiveness. The research also confirmed that the hypothesized difficulty from cultural diversity is difficult to manage and to coordinate. Analysis also confirmed the ongoing and significant problems to the global automotive supply chain by natural disasters and the consequential economic losses.

KEYWORDS

AEC, automobiles, collaboration, communications, human resources, natural disasters, SEM, trust, vehicles.

Introduction

According to [1], firm and market globalization involves reorganization and confrontation between

cultures, both at the organizational and national levels. Therefore, understanding the roles of culture on management effectiveness in supply chains and logistics is critical in cross cultural implementations.

Thailand, as the 12th largest producer of vehicles in the world (“Thailand drops to 12th in world”, 2015) and international hub to the automotive industry’s 10 nation community of ASEAN (Association of Southeast Asian Nations), plays a pivotal role in the region’s global automotive industry’s growth.

Globalization can be discussed as a process by which cultures influence one another and how they exchange information and ideas (Arnett, 2002). As such, the reach of globalization extends to every part of the world, but cultures differ greatly with large variations within regions and within the individual nations. This is consistent with [2] which identified a number of major external changes that all organizations are currently addressing or will have to come to terms with in the 21st Century including technological innovations, increased competition, finite resources and corporate social responsibility (CSR) for the environment and local communities.

Globalization offers enterprises growth opportunities and thus far the key has been the emergence of the multinational corporation (MNC) where workers can be faced with a multitude of language and cultural issues between the local culture and the values of the MNC. The challenge for MNC’s is to create a global culture, and managerial role.



Fig. 1. ASEAN SanApshot. Source: Pattanapanchai, 2015 [3].

As both a logistics and supply chain hub within ASEAN, Thailand also holds the 12th spot in global vehicle production for a multitude of automotive industry MNCs including Ford, Toyota, Isuzu, Denso, etc. It is the third largest sector of Thailand’s economy contributing 12 percent to its GDP [4] and is the largest export industry in Thailand, valued at \$US11.4 billion with a 30 percent growth rate [D].

Cross cultural education and training programs can be seen everywhere, some of which include the Technology Promotion Association, the Thai-Nichi

Institute of Technology, King Mongkut’s Institute of Technology, the Thai-German Institute (TGI) and Japan’s continuous technical assistance from organizations such as JICA (Japan International Cooperation Agency), JODC (Japan Overseas Development Corporation), AOTS (Association for Overseas Technical Scholarship), JETRO (Japan External Trade Organization) and Japanese FDI (Foreign Direct Investment) companies. From 1999 to 2004 the shindan (enterprise diagnostic and advisory) system was introduced to Thailand with Japanese help to produce 450 shindanshi (enterprise advisors).

Currently, the Automotive Human Resource Development Program is implemented with strong cooperation of four leading Japanese auto firms [6] SME finance in Thailand is provided by SME Development Bank, Rural Development Bank, People Bank and Exporters’ Bank. Ford Motor Company established its ASEAN regional headquarters in Bangkok in 2003 and now employs over 10,000 in multiple manufacturing facilities. Toyota Motor (TMC) also opened a development center in 2003, but waited until October 2015 to show it to the media when it disclosed that the research center now has as an estimated 1,400 engineers of which 40% are responsible for the design and evaluation of new pickup truck designs while another Japanese MNC, Mitsubishi Motors established their first overseas test track in Thailand. All this R&D and manufacturing activity has led to Japanese automaker dominance of the Thai market controlling an estimated 80% of the market share [7].

When one walks on Thailand’s automotive manufacturing floors one is constantly exposed to languages from a variety of cultures including every form of English, as well as German, Chinese, Japanese, Czech, Polish, and Spanish. Welding robots have user instructions in Japanese and Chinese with safety signs blaring out warnings in English and Thai. Everywhere you look; one is exposed to and at times overwhelmed with, the cultural diversity of the ‘factory floor’. Management and back office support is no less so with the pace of operations and the associated stress at times leading to breakdown in communications and productivity lapses which is often times due to the inability to understand cross-cultural issues such as Thai ‘Kreng Jai’.

[8] define the most important values of the Thais as social values including kreng jai (respect/consideration is used as a function of feeling uncertain or distanced from people and desiring to avoid offending them), bunkhun (reciprocity of goodness; exchange of favors is used for the base relationship between two people to respect and or do favor

for each other), jai yen yen (take-it-easy means good to keep in mind during tense situations, it highlights Thai cultures' emphasis on staying cool and composed), sanuk (is used as the output of a group that is in harmony; a group that does not have an agenda), and mai pen rai (never mind i.e., people can console a friend who meets with a misfortune). In research conducted on the frequent use of 'mai pen rai', [9] determined that its function within the workplace is to re-establish social harmony. This however could hinder the successful implementation of tasks where specific short-term goals are required, not relationship building.

MNC operations are therefore often confronted with the question of whether to adapt human resource management (HRM) strategies to the work culture of the Thai employees or to use the MNC's 'uniformed', 'standardized' and 'harmonized' concept. Culture is a complex term and as early as 1952, researchers [10] had identified a list of 164 definitions and specifically, with regards to Thailand, [11, 12] determined that the Thai Kingdom differs significantly from Western traditions and cultural values.

An ASEAN Automotive Industry Snapshot

Given the complexities of MNC operations with in multi-cultural environments, it might be surprising to learn that in a Bangkok press conference in April 2016, it was announced that auto sales in Asia were reported to have risen 2.5% year-on-year to 6.9 million units in 2015 [13]. This was supported by a 2016 Canadian ScotiaBank [14] report which stated that 'global car sales continued to strengthen in February 2016, climbing 3% above a year earlier alongside ongoing solid job creation across developed markets'. The optimistic news continued with ScotiaBank further stating that February car sales in Western Europe soared 14% above a year earlier, which was the 'third, double-digit advance in the past four months'. Furthermore, Japan's Nikei news reported new-auto sales in Southeast Asia's six major economies increased for the first time in 28 months in August 2015 edging up a slim 0.4% on the year to 254,918 units as Thailand's decline slowed and Malaysian sales grew despite a consumption tax introduced in April [15].

Thailand. In Thailand, there are approximately 2,355 Assemblers and Tier 1-3 components producers [3, E] in which the industry is segmented into 3 tiers where 1 producers (700) tier are mainly captive suppliers for the Japanese parent group [4]. An excellent example of the cross-culture demands that the Thai and thus ASEAN auto industry has, can be seen in the working of the Thai Summit Group (TSG) which

is a leading OEM auto parts maker to Toyota, Mitsubishi, Mercedes Benz and Volvo. TSG also has facilities in Malaysia, India, China, and Japan through its 20 subsidiaries in most automotive product categories such as press parts, injection parts, aluminum die casting for passenger cars, 2 wheelers and pick-up trucks.

Daisin Thailand is another example where a Japanese auto parts maker uses visual aids to help its Thai workers with procedures. In the lounge, quality-control reports – part of the kaizen technique of continuous improvement pioneered in Japan – are posted on the wall, a sign of the effort the company has put into keeping up with its Japanese competitors [16].

Although Thailand's market share has declined since its peak of 2.462 million units in 2013 [13, 17], it is still the automotive production leader within the 10 member ASEAN community exporting vehicles to over 150 countries [3]. This however might be under some pressure as according to a 2014 report from Japan's External Trade Organization (JETRO), 'Japanese corporations have been moving to reorganize their overseas bases for reasons such as the rise in labor costs... and in recent years, there has been a trend of Japanese companies in Thailand advancing into neighboring countries, called "Thailand-Plus-One" with more than 50 percent targeting "Thailand-Plus-One" countries along the Mekong River (Cambodia, Laos, Myanmar, and Vietnam – the so called 'CLMV' countries) [18]. This of course further adds to the cultural and linguistic complexity of MNC operations.

Philippines. But Thailand is not alone in the automotive industry within ASEAN. In headlines declaring 'Philippines to become major car market by 2020' [19] it was indicated by the Chamber of Automotive Manufacturers of the Philippines Inc. (CAMPI) that vehicle sales were expected to reach a new high of 350,000 units in 2016. This is further supported by first quarter data from CAMPI showing MNC's Toyota, Mitsubishi, Ford, Honda and Isuzu vehicle sales soaring 21.7 percent in the first quarter of 2016 (Fig. 2), growing from 62,882 units from the same 3 month period in 2015 to 76,479 units from January to March 2016 [20].

Also, Korea's Hyundai indicated that it also is looking at the island nation to 'put up either an auto parts manufacturing plant or an assembly plant' [21] as the ASEAN-Korea Free Trade Agreement lowered tariffs on imported Korean vehicles from 25% to 5%. Although all parties to these developments are on the road to success, it won't however be without some cultural and linguistic bumps in the road due the

varied mixes of old colonial Spanish, some Japanese, American English, local dialects and the wide differences between the worker's and manager's religions and cultures such as Buddhism, Protestantism (Baptist), Roman Catholicism or no religion at all as 46 percent of Koreans have stated that they have no religious affiliation [22]. Deciding which holidays to celebrate and which days are paid days off could be an interesting exercise!



Fig. 2. Philippines 2016 Qtr. Auto Sales Report. Source: AUTO, Industry News 2016.

Malaysia. The Malaysian automotive industry has had a multitude of difficulties in 2015, partially due to a weaker national currency (ringgit) and government GST taxes. The industry however did manage to sustain itself at the same pace as in 2014 as in each year approximately 666,500 units were sold [23].

According to [24] no existing business system in East Asia fits the Malaysian auto business sector with Malaysian automotive enterprises spending more attention and resources on internal affairs such as operations and management as compared to external relationships with suppliers and customers [25].

In essays about the Malaysian auto industry scholars discuss the movement from 'monopoly

like market conditions' to 'oligopoly-like' conditions within the 'Bumi' transnational manufactures including Proton and Perodua [24]. These firms either produce a differentiated product or an identical product, with the entry of any new sellers being difficult or impossible.

Proton was Malaysia's dominant auto manufacturer until the establishment of Perodua in 1993. Now the Malaysian auto market is dominated by the two Malaysian national automotive companies, Proton and Perodua which account for approximately 53 percent of the total vehicles sold annually (Fig. 3). Other MNCs such as Honda (15 percent), Toyota (8 percent), Nissan (7 percent), and Mazda (2 percent) making their best efforts however [26].

Originally the automotive enterprises were divided in terms of foreign nationality, which evolved over time from Western nationalities to Japanese, while internally there was a shift from Chinese to Malay ethnicity. Finally, the larger and stronger enterprises became established with ethnic homogeneity in Bumi-owned Proton and Perodua and inter-firm cultural pluralism between these companies and their transnational corporate partners with Chinese managers and Malay workforces [24].

Indonesia. In the January-February period of 2016, Indonesia's car exports plunged 33.7 percent to 22,246 cars from 33,549 in the same period of 2015 [27]. The Association of Indonesian Automotive Manufacturers (Gaikindo) has stated that poor infrastructure facilities at Indonesian seaports and long wait times were the main factors that discouraged investors from pouring their money in the country's automobile industry. According to the World Bank's Logistic Performance Index 2014, Indonesia's logistics costs accounted for 24 percent of its gross domestic product (GDP) in 2014 and ranked 53rd compared to Singapore's number 3 global ranking, thus significantly reducing Indonesia's growth potential and effectiveness [28].

BRAND	FEB 2016	SHARE		JAN 2016	SHARE	JAN - FEB 2016	FEB 2015	SHARE
1 PERODUA	14,014	37.0%	↓	15,538	34.8%	29,552	18,589	36.9%
2 PROTON	5,947	15.7%	↓	7,743	17.4%	13,690	8,254	16.4%
3 HONDA	5,616	14.8%	↓	5,743	12.9%	11,359	6,042	12.0%
4 TOYOTA	2,917	7.7%	↓	2,980	6.7%	5,897	4,990	9.9%
5 NISSAN	2,773	7.3%	↓	3,650	8.2%	6,423	3,515	7.0%
6 MAZDA	782	2.1%	↓	1,354	3.0%	2,136	994	2.0%
7 ISUZU	705	1.9%	↓	811	1.8%	1,516	695	1.4%
8 MITSUBISHI	696	1.8%	↓	1,009	2.3%	1,705	964	1.9%
9 MERCEDES-BENZ	653	1.7%	↓	1,027	2.3%	1,680	491	1.0%
10 BMW	558	1.5%	↓	614	1.4%	1,172	470	0.9%

Fig. 3.

Vietnam. Vietnam's automobile sales reached 56,264 units in the first quarter of 2016, up 38 per cent on-year, according to the Vietnam Automobile Manufacturers Association (VAMA)'s statistics published on April 8, 2016 [29] with Thailand now topping India in previous years as Vietnam's leading importer. In Q1 2016, Thailand exported 7,800 units which was a 64.5 percent increase compared with the same period in 2015 [30]. Thaco became the best-selling brand in the first quarter of 2016, with a total number of 23,485 units, up 60 per cent on-year, simultaneously making up 41.7 per cent of Vietnam's automobile sales. Thaco (Truong Hai Auto), currently assembles and distributes cars for three brands including Kia, Mazda and Peugeot. In the first quarter of 2016, Vietnam imported over 19,700 automobiles, decreasing 16.8 per cent on-year.

Preferential import tax policies caused the sharp increase of cars imported from Thailand, under Vietnam's commitments to the ASEAN Trade in Goods Agreement (ATIGA, n/d). Under the agreement entered-into-force on 17 May, 2010, the import tax on automobiles from ASEAN members would fall from 50 per cent to 40 per cent by 2016, to 30 per cent by 2017 and zero per cent by 2018. Even though ASEAN membership for some appears to be helping, it is interesting to note that overall Vietnam in the first quarter of 2016 imported 19,700 vehicles, which represented a year-on-year drop of 16.8 per cent [30].

This is consistent with an announcement in early 2015 by Toyota Motor Vietnam's president that the world's largest carmaker is considering ending its production and switching to imports in order to enjoy the preferential tax treatment an ASEAN trade pact offers over the next three years [31].

Literature review

Supply chain management

[32] Discussed supply chain management and stated it can be described as everything that happens to a product from 'dirt to dust'. The extended product however includes the basic product or service, the supply chain that delivers it, plus other features and factors that go along with the product or service (Fig. 4).

The concept of Supply Chain Management (SCM) has developed over time from having an intra-organisational focus on logistics to becoming focused on wider inter-organisational issues [33]. Given the globalized nature of trade, manufacturing and R&D in the automotive sector, the need for closer management of the supply chain becomes imperative for success as the complexity of the automotive supply

chain may be gauged from the fact that a typical vehicle comprises approximately 20,000 components with about 1,000 sub-assemblies or modules [34].

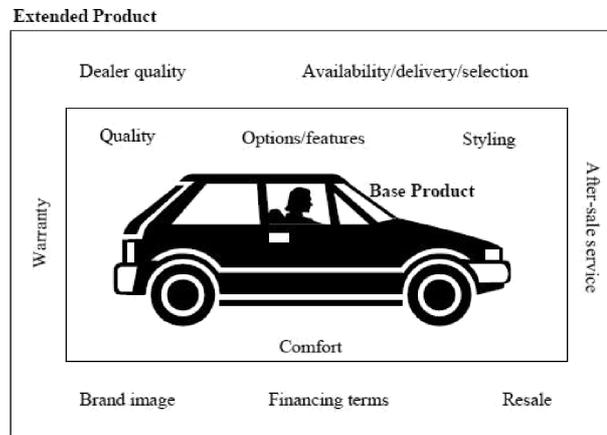


Fig. 4. Supply chain management extended product [32].

In addition to the technological complexity, the OECD has stated that as the organisation of companies have evolved, the subsequent strategic alliances and closer relations with suppliers and contractors have tended to blur the boundaries of the enterprise [35]. This restructuring has been accompanied by new ways of looking at and organising the roles and responsibilities of various actors in supply chains – sourcing and supplying firms, business service providers and policy makers.

Also, the impact of culture on trust and relationships between firms in geographically and culturally diverse regions becomes a major component for an enterprises' success while in today's challenging global markets, the management of relationships are viewed as a key element of successful supply chains [36].

Trust. Trust is the idea that shared information will not be exploited by one party against the other party. This therefore is widely regarded as a precondition for success. If trust is absent, no one will risk moving first, and all will sacrifice the gains of cooperation to the safe. Higher levels of inter-organizational cooperative and coordinating behaviors in shared, flexible planning activities are strongly linked to a supplier's trust in the enterprise which is purchasing the product [37].

This is consistent with [38] discussion about Toyota Australia's buyer relationships and indicated that performance improvement and competitive advantage are achieved by cooperative relations with suppliers which include trust. Further confirmation of this was provided by [39] in their discussion concerning Supplier Relationship Management (SRM)

which indicated that high levels of trust was necessary by suppliers in new product development.

Collaboration. As the complexity of automotive engineering increases, collaboration becomes a powerful tool to address the technical, financial and highly competitive nature of the industry. Similarities to these problems and collaboration's potential success are easy to find with specific examples of Europe's Airbus Industry and America's Boeing aircraft highlighting the success of collaboration efforts on a global, many-billion dollar scale [40].

Automotive manufacturers and suppliers have also begun to integrate their global operations into seamless companies in a pursuit of increased synergies and economies of scale with partnership relations between the buyer and suppliers having been proven to positively affect financial performance of the buyer firm [37, 41]. Collaboration also helps with the identification of risk and the ability to manage it with the management of risk taking place across the network of suppliers and manufacturers [36].

Equally, according to [42], upstream visibility also requires high levels of collaborative planning with suppliers and the use of 'event management' logic to enable alerts of potential supply disruptions to be signaled. No better examples of this can be found than natural disasters that sent disruptive waves throughout the global automotive supply chains in 2011 with the worst Thai floods in 50 years [43], and in the March 2011 and the April 2016 Japanese earthquakes wreaking havoc both to the automotive supply chain and their respective economies [44]. An example of the worldwide impact of a natural disaster on one side of the world effecting production on the other side can be seen from the General Motors idling for two weeks of four plants in North America because of parts shortages caused by the April 2016, 7.3 Japanese earthquake [45].

Commitment. According to [46, 47] an enterprise's trust in a joint venture partner is predicated on that firm's investment in the JV and the ability for negotiated exchanges. Furthermore, information sharing has a primary impact on reducing a partner's uncertainty which in turn improves the level of trust. This is consistent with which stated that trust and information sharing significantly influenced the level of relationship commitment of the Malaysian firms surveyed.

Communication. Once again, in research conducted at Toyota Australia by [38], it was determined that effectiveness of the supplier-buyer relationship was influenced by elements such as such as communication and information sharing, learning and the involvement of workers in the buying firm's programs.

The way in which input is received and interpreted is influenced by an individual's culture [48] which can therefore lead to multiple workers receiving the same message but perceiving two completely different meanings [49]. Additionally, when the purchasing enterprise provides technical assistance to suppliers, the performance dimensions of the buying firm will improve in terms of cost, quality, productivity, and design [50]. Supplier development results in reduced costs, improved communication, risk sharing, and improved problem solving [51].

Logistics management

[52] Determined that a well-operated logistics system can enhance the competitiveness of both government and commercial enterprises. Logistics and management techniques can also help with the optimization of current manufacturing and distribution processes increasing the efficiency and competitiveness of the enterprise. This is consistent with [53] which stated that there is a proven and significant role of logistics in integrating marketing and management systems of a company.

From the research, logistics management was determined to have three key elements including the physical supply, physical distribution and the environmental condition. Physical Supply and physical distribution.

These components include all the activities involved in moving goods, both from the supplier to the beginning of the production process and from the end of the production process to the consumer. They also focus on the logistics operations after raw materials are built into finished products and used with outbound transportation [54]. Also, physical distribution with its outbound orientation represents about two thirds of logistics costs [55]. Physical supply also influences stock level, line shutdowns and delays and also the utilization of labor and production [56].

Environmental condition. The environmental condition is about the material handling of logistics activities both before and during logistics processes, such as procurement, raw material warehousing, inbound transportation and production support. The environmental condition also includes governmental laws, the political environment and the dynamics found to have strong and positive influences on an organization's performance [57].

Organizational effectiveness

Organizational effectiveness can be thought of in various ways, with one definition being the efficiency with which an organization meets its objectives. Another can be the ability to be productive with a

minimal amount of waste. Organizational effectiveness is also the capacity of an organization to produce the desired results with a minimum expenditure of energy, time, money, and human and material resources [58].

Organizational effectiveness is also defined as an external standard of how well an organization is meeting the demands of the various groups and organizations that are concerned with its activities which approximately is a construct for doing the right things or having validity of outcome. Effectiveness is achieved through customer orientation and innovation and is often used to describe an organizations' performance. Efficiency on the other hand is seen as a "value free" quantifiable measure – highly valued as a rationale for activities such as improvement programs or as a base for rewards.

Therefore, for this study, the researchers developed a tool to measure and gauge organizational effectiveness according to the following criteria:

Quality. Increasing global competition has forced automotive companies to improve quality and efficiency [59]. Quality which is a measure of the rate of defects and development and is therein described as a compound evaluation of quality, delivery, cost, and overall capability. Effectiveness is accessed when deliveries is in line with what is agreed upon in contractual or verbal agreements [60].

Flexibility. According to [61] 'flexibility is the ability to adapt, in a reversible manner, to an existing situation, as opposed to evolution, which is irreversible'. Companies must realize the real competition is not firm-to-firm, but supply chain-to-supply chain [62].

Staff Satisfaction. From the literature and various studies it was concluded that empowerment and recognition have positive effects on employee motivation [63] but money is the fundamental inducement, as no other incentive or motivational technique comes even close to it with respect to its influential value [64]. This is consistent with [65] which concluded that "Money is the crucial incentive ... no other incentive or motivational technique comes even close to money with respect to its instrumental value" (p. 379).

Delivery. In order to develop and maintain a viable service delivery program, the realities of cost effectiveness and cost efficiency must be addressed. Cost effectiveness relates to value of the outcome compared to the expenditures [66].

After an analysis of the problems and the associated reasons, the researchers developed a structural equation model (SEM) to study the structure of Logistics Management and Supply Chain Management

that affect Organizational Effectiveness (Fig. 5 and Table 1).

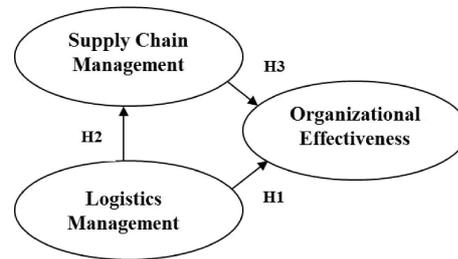


Fig. 5. Conceptual model.

Table 1
Statistical values presenting convergent validity of the reflective scales of the latent variables.

Construct/Item	Loading	t-stat
Logistics Management		
Physical Supply	.8789	42.1440
Physical Distribution	.8873	34.0603
Environmental Condition	.9091	79.3900
Supply Chain Management		
Collaboration	.8243	30.2469
Trust	.8348	38.2778
Commitment	.7745	19.0460
Communication	.8355	34.0852
Effectiveness		
Quality	.9230	81.2428
Flexibility	.9385	118.1450
Staff Satisfaction	.8864	51.2299
Delivery	.8549	33.1373

Furthermore, a review of the literature determined that factors influencing Organizational Effectiveness are quality, flexibility, staff satisfaction and delivery. Supply Chain Management factors included collaboration, trust, commitment and communications. Logistics Management was influenced physical supply, physical distribution and environmental conditions.

After a review of the literature and development from the above concepts, the following 3 research hypotheses were created (Fig. 5):

H1: Logistics Management influences Organizational Effectiveness.

H2: Logistics Management influences Supply Chain Management.

H3: Supply Chain Management influences Organizational Effectiveness.

Methodology

Research was conducted within Thai and multinational automotive industry enterprises located within the manufacturing clusters on Thailand's

‘Eastern Seaboard’ which is the area extending from Bangkok’s metropolitan area southeast along the Gulf of Thailand’s eastern shore to the coastal provinces of Chonburi and Rayong where multinational firms such as Ford, Toyota, Isuzu, Mazda, Suzuki, and Denso have their facilities.

Data collection

Data for the sample were collected in 2015 using a seventeen-page consisting of 27 questions for Organizational Effectiveness, 28 questions concerning Supply Chain Management, and 56 questions concerning Logistics Management. Cross cultural effectiveness questions were included in the 28 question Supply Chain Management component of the questionnaire, which dealt with trust (8 questions), collaboration (10 questions), communications (6 questions), and Commitment (4 questions).

[67] discussed the analysis of structural equation modeling and indicated the ratio between the sample numbers and the number of parameters, estimated or observed variables, should be 20:1. This is also consistent with [68] which discussed an alternative estimation strategy as well as [69] and [70]. As the research consisted of 11 variables, 220 samples were obtained which was deemed as highly reliable [71, 72].

This paper was based on an extensive literature review and a qualitative study comprising 5 in-depth interviews and a focus group meeting with senior supply chain executives. Using a 7-point [73], survey questionnaires were created to measure concept definition and practice. The five experts in their related disciplines were tasked to assure the content, quality and reliability of the developed surveys. This was partially accomplished by use of [74] index of Item-Objective Congruence (IOC) which was used to carry out the screening of questions using a factor of 0.50 or higher to determine the sample validity.

For the study Cronbach’s alpha was used [75] to evaluate the 5-point [73] scale rating matrix. The value of alpha (α) that are considered acceptable ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from multi-point formatted questionnaires or scales, with a reliability score of 0.70 or higher being considered a reliable score by many researchers [75]. As the study’s average value of the correlation coefficient was found to

be 0.83, the results were deemed to be sufficiently reliable.

Dependent variable

Effectiveness analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert Scale [73] which was conceptualized and built from scales enabling the measurement of the manifest variables Quality, Flexibility, Staff Satisfaction, and Delivery.

Independent Variables

Logistics Management analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert Scale [73] which was conceptualized and built from scales enabling the measurement of the manifest variables Physical Supply, Physical Distribution, and the Environmental Condition.

Supply Chain Management analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert Scale [73] which was conceptualized and built from scales enabling the measurement of the manifest variables Collaboration, Trust, Commitment, and Communication.

When measuring variables with reflective analysis, convergent validity has been used with loading used as consideration criteria which must be a positive quantity and indicator with a loading of more than 0.707. All values are statistically significant ($|t| \geq 1.96$) representing the convergent validity of scales [79, 80] as shown in the analysis results in Table 1 below.

According to [81], ‘discriminant validity assessment has become a generally accepted prerequisite for analyzing relationships between latent variables’. Furthermore, for variance-based structural equation modeling, such as PLS, the [77] criterion and the examination of cross-loadings are the dominant approaches for evaluating discriminant validity’. Therefore, analysis of the data validated that there was discriminant validity for each construct, without exception and that results of the study’s discriminate validity testing are shown in Table 2 below. The reflective model in Table 2 shows the discriminant validity of the internal latent variables and the correlation of variables. It also depicts the scale reliability which has been analyzed from Composite Reliability (CR) as well as the (Average Variance Extracted). The CR value should not go below 0.60 and the AVE values should also drop below 0.50 and R2 values should not be under 0.20 [79].

Table 2
Inter-construct correlation, square root of AVE, composite reliability, and the Pearson coefficient of determination (R²) of first-order factors.

Construct	CR	R ²	AVE	cross construct correlation		
				Logistics Management	Supply Chain Management	Effectiveness
Logistics Management	.921		.795	0.892		
Supply Chain Management	.890	.5788	.668	0.761	0.817	
Effectiveness	.945	.7194	.812	0.829	0.943	0.901

Note: CR = composite reliability; R² = square of the correlation; AVE = average variance extracted.

Notes: Statistical significance level is at 0.01 and diagonal figures mean \sqrt{AVE} .

Data analysis

Quantitative Measurement. The analysis of ASEAN/Thai automotive industry effectiveness used a measurement instrument or questionnaires utilizing a 7-Point Likert Scale [73]. This quantitative approach has the clear advantage that it allows comparability between different Thai and multinational enterprises over time. The quantitative data were analyzed with the Partial Least Squares statistical tool with the hypotheses validated by use of PLS (partial least squares)-Graph software [76]. The analysis results were displayed as a model structure to determine manifest and latent variables. The measurement tools' validity and reliability were analyzed and their internal consistency was measured by Cronbach's α -coefficient which was found to range from 0.807 to 0.850, which indicates a high reliability level.

Convergent validity can be examined through CFA within PLS modeling with the three criteria recommended by [77] for establishing convergent validity being:

1. All indicator factor loadings should be significant and exceed 0.707, so that over one half of the variance is captured by the latent construct [78];
2. Construct reliabilities should exceed 0.70;
3. Average variance extracted \sqrt{AVE} of each construct should exceed 0.50.

When measuring variables with reflective analysis, convergent validity has been used with loading used as consideration criteria which must be a positive quantity and indicator with a loading of more than 0.707. All values are statistically significant ($|t| \geq 1.96$) representing the convergent validity of scales [79, 80] as shown in the analysis results in Table 3 below.

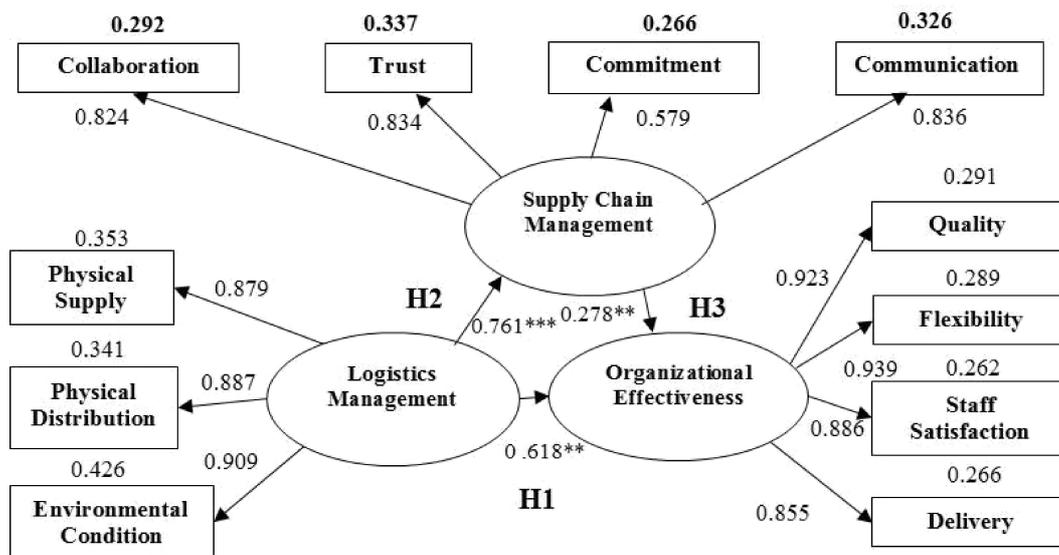
According to [81] 'discriminant validity assessment has become a generally accepted prerequisite for analyzing relationships between latent variables'. Furthermore, for variance-based structural equation modeling, such as PLS, the 'Fornell-Larcker criterion and the examination of cross-loadings are the dominant approaches for evaluating discriminant validity'. Therefore, analysis of the data validated that there was discriminant validity for each construct, without exception and that results of the study's discriminate validity testing are shown in Table 3 below. The reflective model in Table 2 shows the discriminant validity of the internal latent variables and the correlation of variables. It also depicts the scale reliability which has been analyzed from Composite Reliability (CR) as well as the (Average Variance Extracted). The CR value should not go below 0.60 and the AVE values should also drop below 0.50 and R2 values should not be under 0.20 [79, 82].

Table 3
Research hypotheses test results.

Hypotheses	Coef.	t-stat	Results
H1: <i>Logistics Management</i> has a direct and positive effect on <i>Organizational Effectiveness</i> .	.761***	17.7403	supported
H2: <i>Logistics Management</i> has a direct and positive effect on <i>Supply Chain Management</i> .	.618**	11.3974	supported
H3: <i>Supply Chain Management</i> has a direct and positive effect on <i>Organizational Effectiveness</i> .	.278**	4.5267	supported

Note: t-stat 1.96 means significant at $p \leq 0.05$.

** indicates a significance level at $p < 0.05$ and *** indicates a significance level at $p < 0.001$.



** indicates a significance level at $p < 0.01$ and *** indicates a significance level at $p < 0.001$

Fig. 6. Final model.

Supply Chain Management factors underlying the manifest variables influencing the collaboration, trust, commitment and communications with values of 0.292, 0.337, 0.266 and 0.326, respectively as shown in Fig. 6 below.

Additionally, there was a 95% confidence interval ($t\text{-stat} > 1.96$), which reflects a significance level of 0.05 which considers such factors as highly reliable. Supply Chain Management has a direct and positive effect on Organizational Effectiveness, as can be seen from $\beta = 0.618$ and $p < .001$ (Fig. 6).

Logistics Management factors underlying the manifest variables influencing the physical supply, physical distribution and the environmental conditions with values of 0.353, 0.341, and 0.426, respectively as shown in Fig. 6 below.

Additionally, there was a 95% confidence interval ($t\text{-stat} > 1.96$), which reflects a significance level of 0.05 which considers such factors as highly reliable. The model confirms that Logistics Management increases Organizational Effectiveness and that it has a direct and positive effect as determined by $\beta = 0.618$ and $p < .001$, which supports Hypothesis 1. Furthermore, Logistics Management has both an indirect but positive effect on Organizational Effectiveness through Supply Chain Management as witnessed by $\beta = 0.761$ and $\beta = 0.278$ and $p < .001$, which supports Hypothesis 2 and Hypothesis 3 (Fig. 6).

After analyzing the data for the latent variables and the consistency of the model, the latter was submitted for verification of the hypotheses. The results of the hypotheses are presented in Table 3.

Results and discussion

Results from the study on 'Cross Cultural Logistics and Supply Chain Management Organizational Effectiveness within the ASEAN/Thai Automotive Industries: A SEM Analysis' indicated that logistics has become critical to an enterprise's success in international markets due to the different cultural, legal, physical, and distribution environments [82]. However, due to the evolution of technology and capabilities across international supply chains, the term 'logistics' is often now being replaced with the term 'supply chain management' which has an end-result of competitive advantage as compared to logistics' end-result of customer satisfaction (Fig. 7).

In this context, no better logistics marketing expression can be found than that of the global overnight express package company Federal Express's (FedEx) 'When it absolutely positively has to be there overnight' [83] which points out the importance of customer satisfaction' as the outcome. Supply Chain Management however kicks-in when the same overnight express company co-locates automotive parts warehouses next to its global, aviation and ground-transport distribution hubs [84].

[42] also pointed out that collaboration within the supply chain and the exchange of information can reduce uncertainty, with trust being a key ingredient to a JV's success [42, 46]. This was confirmed from the study's research as communication (0.836), trust (0.834) and collaboration (0.824) were ranked as sig-

nificant components of cross-cultural, Supply Chain Management effectiveness.

BASIS FOR COMPARISON	LOGISTICS MANAGEMENT	SUPPLY CHAIN MANAGEMENT
Meaning	The process of integrating the movement and maintenance of goods in and out the organization is Logistics.	The coordination and management of the supply chain activities are known as Supply Chain Management.
Objective	Customer Satisfaction	Competitive Advantage
Evolution	The concept of Logistics has been evolved earlier.	Supply Chain Management is a modern concept.
How many organizations are involved?	Single	Multiple
One in another	Logistics Management is a fraction of Supply Chain Management.	Supply Chain Management is the new version of Logistics Management.

Fig. 7. Logistics management vs supply chain management (Surbhi, 2015).

Another aspect which came into play as the research evolved was what the researchers termed ‘logistics redundancy’. From the literature review, management surveys, and focus group discussions, as well as an analysis of past and present world natural disasters affecting the automotive supply chain, it became apparent that some form of mechanism needs to be put in place to preclude the significant and frequent economic loss due to natural disasters such as floods, earthquakes and tsunamis, and their ability to disrupt the global, automotive supply chains [43–45]. The researchers refer to this mechanism as ‘logistics redundancy’.

The World Bank estimated that the 2011 floods in Thailand caused an estimated loss of 4 percent to the GDP of their respective sectors, including 2 percent in the industrial estate automotive clusters which are part of the regional supply chains [85]. In the same year, the March 2011 earthquake and tsunami in Japan destroyed a key plant which produced 40 percent of the world’s microcontrollers halting car production around the world. During this period small car manufacturing in Thailand swung from a growth of 46 percent in February 2011 to a 40 percent decline in April [86].

One solution the researchers conceptualized was the idea of creating ‘hardened’, flood-proof, international automotive supply ‘dépôts/depots’ of automotive parts at logistics hubs at key sea and airports, such as Suvarnabhumi International Airport in Bangkok, Thailand, which is the present geographical and aviation logistics hub for ASEAN’s automotive industry.

Research also suggests that market ‘niches’ are appearing within the Asian automotive industry as Thailand has become the world leader in light pickup trucks with a future focus on ‘green’ technologies and electric passenger vehicles [5], India appears to be focusing on two-wheel vehicles and ultra-small cars, whereas Indonesia is making an attempt to specialize in utility vehicles.

Cross-cultural organizational effectiveness challenges

Thailand. [48], a multicultural workforce is rapidly and irreversibly becoming the norm in a large number of organizational situations and ‘unfortunately, nowadays, this fact is claimed to influence organizational performance negatively’. This is consistent with an analysis of German MNCs with operations in Thailand where German HR managers concluded that since they could not apply the HR approaches based on German work values, they therefore could not reach the intended goals [87]. Furthermore, humor and indirectness, traits Germans are not especially renowned for, were however important to their Thai counterparts and employees. Also, from the research by [87], it was further stated by German HR staff that since Thai workers are so dependent on personal relationships, when ‘an expat leaves, we start at zero again’.

Malaysia. [24] In their research on the Malaysian automotive industry concluded that no existing business system in East Asia fits the Malaysian auto business sector. In the Malaysian MNC Proton-Mitsubishi alliance which has been ongoing since 1982, racially there were 1.5 percent Chinese, 2.2 percent Indians and the rest (96.3 percent) were Malays with the majority of management also dominated by Malays [88].

This is in stark contrast with other Japanese MNC operations where top management is dominated by Japanese male executives such as Toyota where only 11 percent of Toyota’s mid-to-senior level management in Japan are women, with only 1 percent of executive committee members being female [89]. Toyota has stood out for having few foreign executives and currently, only seven of Toyota’s 57 executives are foreign. Also, like in Japan (but very much unlike Thailand), women hold only 3.4 percent of the total positions and of this small percentage; only 24 percent are in executive positions in the MNC Malaysian/Japanese Proton-Mitsubishi alliance.

In research conducted by [90] on Japanese JV education and training in the Malaysian auto industry, research concluded that ‘after years of training efforts, only slight improvement can be seen in employee skills’. This conclusion was based on input

from one JV which was 5.56 percent Japanese and 94.44 percent Malaysian and another JV firm which was 32 percent Japanese and 68 percent Malaysian. Language barriers were the significant constraints to skill development between Japanese management and Malaysian workers, with inadequate time devoted to training, and high absenteeism and turnover also significant problems. Japanese manufacturing operations depend on on-the-job training and job rotation as key factors in skilled worker development [91]. Also, plant worker excessive absenteeism and high turnover of manufacturing workers seems to also be the major problem even in non-Japanese firms [90].

Vietnam. Presently, more than 100,000 people are working in the Vietnam automotive industry including assembly workers, engineers, and managers at different levels. Also, according to [92], leadership effectiveness is a key factor in the successful implementation of Vietnamese JVs where compatibility and complementarity leadership styles are the foundation for such partnerships. Building shared values in the joint venture is critical to performance, to creating an appropriate organizational culture, and to accomplishing effective organizational change. Once again, we see Japanese firms such as Mazda bringing their management and cultural traditions into the expansion of operations ahead of the 2018 ASEAN zero tariff on auto imports with a goal of manufacturing and assembling 100,000 Mazda vehicles per year [93] with up to 50 automotive parts supply firms looking to start new operations around the Mazda facility in the central province of Quang Nam.

Impact to industrial manager and academic researcher

Results also showed that the respondents were of the opinion that the logistics management focus exclusively from customers is important to the firm. In addition, the survey also covers the logistics management focus on customer needs and all of the above is linked to the relationship between the logistics management, supply chain management and effectiveness found that all variables are correlated with each other, certainly. Those related to streamline operations to meet the needs of their clients. And all variables are significant objectives for the implementation of the managers properly and effectiveness

Conclusion and implementation

The research confirms that the hypothesized difficulty from cultural diversity is difficult to manage

and to coordinate but it could also bring some positive effects if heterogeneous energies, viewpoints, actions, perceptions, and skills, are effectively integrated. Therefore, cultural values from the environment are brought into the workplace and have a strong impact on both personal behavior and organizational effectiveness and must be addressed at all levels for cross-cultural, organizational effectiveness to be achieved.

It also became apparent from the research that natural disasters are frequent and highly disruptive to the global automotive supply chain and steps must be taken to offset the significant and continuing loss to economic growth and organizational effectiveness to both sector members and the global industry. The implementation of strategically placed, environmentally 'hardened', automotive parts logistics depots might be one solution to the problem.

Also, according to the World Bank, East Asia and Pacific economies accounted for almost two-fifths of global growth in 2015, more than twice the combined contribution of all other developing regions which is expected increase slightly to 4.8% in 2016 driven by growth in the large ASEAN economies (barring more natural disasters). This is a contributing factor to the potential for success as the automotive sector implements its strategic plans and vision.

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