



## Strategic Information System for Decision Making in Railway Supply Chain Management

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### ABSTRACT

Information System (IS) is transforming how the industry operates, and over the next few years, widespread adoption is expected across the industry. Today, however, many organizations are still in the early stages of integrating IS into their supply chain management and are unclear on how to achieve the scale necessary to produce substantial industry value. The recent IS can be conveyed in a method that guides to managerial, societal, and organizational advancement. We intend to develop and shape the industry and technology strategies and to deliver the kind of positive changes that add real value to the organization as thinking and doing towards strategic decision making and implementation. Strategic IS for decision making in operation, financial, workforce management and supply chain will deliver industry outcomes that pioneering solutions. The key concentration in the study of employ this progress is basic to executives in our fast-changing, uncertain world, and complex. Therefore, strategic IS for decision making context will be a practical element that is intelligent to practitioners, academics, and students with empirical and practical experience. This study discussed strategy shifts and alignment that can be applied for best thinking and best practice in the railway supply chain management as thinking pragmatically to the circumstances. Thus, we intended to explain the value-adding and potential quality of IS for using within the advance forward-thinking industry.

**Keywords:** Decision Making, Information System, Supply Chain Management, Strategic Management, Railway Industry.

### 1. INTRODUCTION

Better decision making in industry, lead towards the moment to transfer the value chain [1]. The leading industry has already seized the opportunities presented by the Information System (IS) shift to employ strategic digitalization to better decision making beyond the organization [2]. The industry

needs the future role of IS in their organization that can be committed, understand, behavior, and practice towards new strategic analysis [3]. Furthermore, industries need to avoid failures due to poor digital managing and need to gain insights from their decision-making area on high technology high value [4]. The perception of IS to assist conduct all successful, to augment intelligence, and to better decision making by providing useful information and support the industry agenda in the development planning on increasing the service through creativity in managing the technology innovation.

Over the years, there had been a growing concern of IS development among industries with regards to the slow adoption of IS [5]. Industries are confronting immense dilemma because of the passive adoption of technology and acquire below-moderate IS savvy and rarely utilize for decision making at their operational level, while they also find IS adoption is difficult and thus Railway Supply Chain Management (RSCM) is in the late majority in the adopter category [6]. RSCM is still bond using the conventional method of doing business. As technology evolved, the target lifted from daily activities to a long-term strategic aspect of industrial action [7]. Recognizing the important role of IS to RSCM in the economy, the organization is committed to support and nurture the development of IS to ensure its competitiveness and sustainability.

This tangled adopting systems and technologies in the remake current approach of employed to ensure consistency, direction, and decision making [8]. There need to identify the status level of IS adoption and usage as useful information and guidance to related bodies for developing further strategies [9]. Top-operation industries commonly have great operating IS and decision-making actions [10]. As a greater understanding of technology development, decision-makers were capable to perceive advanced approaches to employ technology which therefore implements a more compelling use of data [11]. These dominant industries view to their IS action to not only engage nicely and crop detailed decision making and utilize management information that assists better decision making and prop value conception.

Systems and technology are industry mechanisms [12]. Virtually, the IS capacity of the organization contributes to following basic industry priorities and developments [13]. Better decision making is becoming fundamental to good industry execution [14]. IS shift providing an excuse for the industrial action to become extra dynamic and to improved decision making.

**2. STRATEGIC INFORMATION SYSTEM CONTEXT**

The way the leading industry has engaged in IS action implies to be the base for their industry benefit [15]. The new direction has appeared over customer relationship management, system innovation, global communication, social networking, outsourcing, managing complex adaptive systems, and knowledge management. Industry decision-makers need to yield signs that decline to catch this technology moment to convert the IS action capability lay their industry’s competing situation at prospect. They must consider the industry commitment and initiatives in the development of IS in a comprehensive and coordinated way [16]. IS shift did not arise as promptly as was expected [17]. But dominant industries have earlier rise to the hope conferred by progress in technology and globalization.








We need to view on two basis field from the drive for ability and the demand to comprehend for capability within the industrial process. IS shift may intimidate conventional aspects in the outline of management information, but it further yield intriguing advance events [18]. Changing the management agenda, along with changing technology will drive towards opportunities in IS function. These converge are planned towards industry improving competitive advantage progress over the implementation and adoption of

technology and systems. The IS function plays a huge aspect in strategy management plus implementation. Thus, an efficient digital industry will coordinate the standards and transforming the industry toward digitalization.

IS shift nonce an excuse for the industry to catch on a deep aspect in improving decision making in organizations [19]. An information system is an approach that is currently applied in an increasing range of different disciplines [20]. IS shift has usually endure treated in the premise of the percussion of competitive pressure, developments, and market forces in Information and Communication Technology (ICT) and globalization on the IS action. Thus, we need to view on developing a great strategy with changing the dynamics in the decision making of an industry. However, it is also fundamental to view now on a deep aspect within the leaders who can think strategically and solve systemic problems within the industry context.

The industry needs four (4) strategic shifts in their organization for reliable IS that deliver a consistent and predictable IS experience. IS function needs to provide an actionable guide to helping strategy turn into successful execution [21]. Moreover, it needs to enhance industry processes and upgrade the industry value chain that creates a good decision-making process. Strategy shifts play a vital role within the modern economy and industry setting characterized by strategic procurement, operational environments, and industry alliances. Furthermore, strategy shifts use both the knowledge and technology of the industry to enable the organization and supply chain to respond instantly to changes in the marketplace. Thus, we have tabled the strategy shifts of IS for the supply chain context, as shown in Table 1.

**Table 1:** Strategy Shifts of Information System for Supply Chain context

Strategic Shifts	 <b>Enhancements</b>	 <b>Expansions</b>	 <b>Extensions</b>	 <b>Exits</b>
 Business Model (Organization Strategy)	Improve the alignment of the present business model.	Add a new revenue stream.	Broaden into an advanced business model.	Exit a business model.
 Value Chain (Systems Strategy)	Improve operation relation with present suppliers.	Add new suppliers and outsource an activity	Extend into new suppliers.	Refrain exploiting business with a supplier or in-source an action.
 Market Environment (Management Strategy)	Attract new customers within existing markets.	Expand into new markets and segments.	Extend into new markets and segments.	Exit a market and segment.



 Product or Services (Resource Strategy)	Improve quality, merger ease of use, and compute appearance.	Compute advance services and products.	Extend new and products services.	Drop a product and services.
 Technology Channel (Technology Strategy)	Improve the quality and capacity of technology.	Add new quality and capacity of the technology.	Extend the new quality and capacity of the technology.	Exit the quality and capacity of the technology.

Table 1 implies the strategy shifts of IS for supply chain situation that consists of four (4) indicator as; (1) Enhancements focus on incremental changes on existing value chain and markets, (2) Expansions focus on launching of new products into new markets or launching new service to an existing market, (3) Extension focus on launching a new business model and (4) Exits focus on dropping a product or exit from a market. All these strategy shifts, IS using can be the view for coordinating, sustaining, and driving the demanding industry strategy of supply chain management. Therefore, strategy shifts of IS for supply chain context offers practical advice to help decision-makers to maximize value and benefits towards the industry.

Moreover, developing a strategic order is one of the greater crucial IS a concern. Strategic alignment regulates the relationships among the business realm and the IS realm of industry. Thus, it is critical to any decision-makers to any industry that wants to achieve its goals and competitive advantage. Strategic alignment can improve the value and business model of an organization. Yet, aligning the industry activities is the strategy that makes the difference to the organization itself. Therefore, we have figured the alignment of the IS realm and business realm, as exposed in Figure 1.

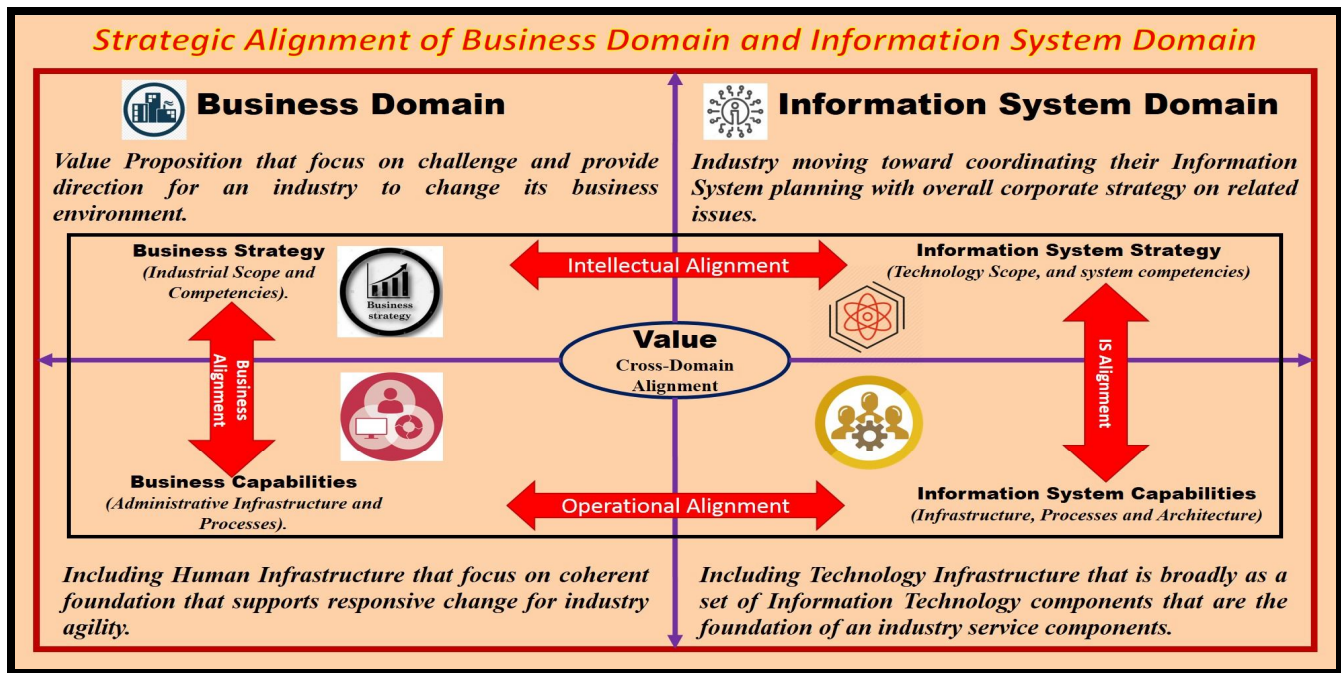


Figure 1: The alignment of Business Domain and Information System Domain.

Figure 1, displays the alignment of the IS realm and business realm as influencing and supporting the strategic guidance of the industry over the recognition of value-adding digitalize IS. Furthermore, coordinating and integrating diverse industry technologies over the expansion of holistic IS architecture and expanding broad strategies for outstanding systems implementation for an RSCM in an industry context.

Thus, we need the alignment between the business and IS strategies as strategic plan and technology opportunities. The alignment between strategy and capabilities as business organization and process and IS architecture for an organization context will emphasis on industry change and human resource issues with IS implementation as a tool.

### 3. PERCEPTION SUPPLY CHAIN MANAGEMENT CONTEXT

Decision-makers can recognize, industries acquire to construct compelling business models [22]. There is constant pressure on decision-makers to enhance the ability of their supply chain, allowing products to move quickly and at low cost [23]. This pressure has encouraged a stream of IS initiatives and methods for managing the supply chain [24]. Progress confides on building activities that can make, deliver, and design high-quality, innovative, services, and low-cost outputs that demanded in retail [25]. Supply chain management is a surprisingly new concept and is at a very early stage of development [26]. As decision-makers, generally, assets that their industry absence needed IS resources and skills on the effectiveness of supply chain performance, and technology [27].

A huge number of decision-making events can affect the operations of a long and complicated supply chain [28]. We need to promote the greater utilization of IS and integrated technology for the supply chain of the industry process. Strategic supply chain management is the function responsible for managing it and comparative advantage applied at the industry level. Therefore, we identify two (2)

key issues have become relevant to IS development for supply chain management; (1) creating a digital efficient supply chain management that can compete in the regional and global and (2) focusing on the income of the organization, which mainly increase the levels through digitalization. Early identification and development of IS will be the key to minimizing its negative effects and to getting the supply chain management on the right road.

Furthermore, the early development of IS in supply chain management is an important key to reducing complex operating models in the future [29]. Strategic IS for decision making is important because it established the digital industry, agile technology, that can strategize supply chain management with easy to use, and simple decision-making process. We need the alignment of IS strategy with industry supply chain strategy that enables initiatives for gaining competitive advantage and architecture for sharing supply chain data through integration technologies. Yet, the balance between supply chain thinking and IS action regarding the nature of the technologies that we utilize in the information landscape for decision-making purposes. Therefore, we have tabulated the IS perspective as a strategic supply chain resource, as shown in Table 2.

**Table 2:** The IS perspective as Strategic Supply Chain Resource.







Strategic Process	Classification	IS Perspective as Strategic	Supply Chain Resource
Formalization	Processes systemize information collection and dissemination	 Sourcing and Procurement	Formalized techniques adopted to conduct strategic planning.
Flow	The focus of the authority of authority for the strategic plan.	 Product Lifecycle Management	Aspects caper by industry and organization decision-makers at the inception of the plan action.
Consistency	Anxious with the density of plan action and strategic decision.	 Logistics and Distribution	High-level consistency indicates an extended plan action with planning strategic direction.
Focus	The equity among control and creativity direction implicit with the strategic plan.	 Enterprise Asset Management	Combining direction target extra on the discipline of assets within the organization.
Participation	The broadness of organizational crisis in the strategic plan.	 Supply Chain ERP	Isolated approach to planning operational areas.
Comprehensiveness	Competently seeking for knowledge to classify different behavior	 Integrated Supply Chain Planning	Formulation accurate ideas, plus the attention of probability for achieving a selected behavior.

Table 2 indicates the IS perspective as a strategic supply chain resource that reflects as a profile of positive adaptation on high-level comprehensiveness, high-level participation, high level on consistency, high level of formalization, focus on planning flow, and focus on creativity. This is the capacity of strategic planning systems to positively regulate, the planning system as a design for extra outstanding and value-added on improving supply chain management with actionable implementation. The strategic IS for decision making will be an organized convert of the moment that adapts persistent comment and solution search through focus planning effectiveness.













#### 4. RAILWAY SUPPLY CHAIN MANAGEMENT CONTEXT

The railway industry shows a critical aspect of the economic surge of Malaysia with the contribution of 35% of the Nations's Gross Domestic Product (GDP) [30]. Malaysia aims to venture into the train manufacturing industry and becoming the ASEAN rail manufacturing hub on light rail transit, metro, suburban rail, locomotive, and cargo trains [31]. Furthermore, having joint ventures with local companies, that allows the local suppliers to learn about the railway industry itself [32]. Moreover, Malaysia has its First Train Assembly Plant in Sungai Buloh Depot, Rasa, Hulu Selangor [33]. Thus, the Malaysian Government's future is on

rail investment by leveraging rail investment in the pipeline until 2030 and beyond [34]. Railway industry in Malaysia plays an important element in national development agenda that emphasizes on (1) economic transformation program focusing on a building an integrated urban mass rapid transit system and high-speed rail system [35], (2) government transformation program focusing on improving urban public transport on vehicle availability, accessibility and connectivity [34], and (3) national industrial development plan on facilitating overall train logistics development as well as developing rail freight service. The Malaysian government's intention is on supply chain localization that will increase the economy, human capital, market access, and collaboration [36].

Moreover, technology transfer will occur in the railway industry development that integrates the supply chain management [37]. Strategic IS for decision making is directly growing the view of many industries and their business model [38]. Therefore, RSCM is also impacted by the IS function, and strategic management desire an extra clear perceptive of the presently interrelated and available technologies. Yet, RSCM will endure an industry adjust, we need to understand the impact of IS by a holistic strategic decision-making perspective. Therefore, we have tabulated the strategic IS for decision making in RSCM, as exposed in Table 3.

**Table 3:** The Strategic Information System for Decision Making in Railway Supply Chain Management

Railway Supply Chain Management	Decision-Making Perspective	Strategic Information System	Value-Added Perspective
 Tier 1-Final Integrator Complete Train	 Prescriptive Analytical for a complete train.	 Strategic Monitoring System (Integrated tools for planning complete train)	 <i>Action</i> Prediction and Strategy Analytics Formulation (Foresight-Accomplishment)
 Tier 2-Major systems and sub-systems Integrators Train	 Predictive Analytical for train integrators.	 Tactical Monitoring System (Information bundles completing the Train Integrators)	 <i>Decision</i> Visualization and Value Analysis (Hindsight -Description)
 Tier 3-Components and Parts Manufacturers	 Descriptive and Diagnostic Analytical for components and parts.	 Operational Monitoring System (Integration of Components and Parts)	 <i>Information</i> Reporting and Monitoring Performance (Insight Direction)

Based on Table 3, the strategic IS for decision making in RSCM indicates the design, manufacturing, and assembly in a typical railway industry that will support the industry change. Emergent system of the overall RSCM activity should reflect on the strategic IS for decision making on tier 1-final integrator complete train on train builders, suppliers and manufacturers as the modification or upgrade, tier 2-major systems and sub-systems train integrators on rail vehicle body suppliers, mechatronics supplier and electrification suppliers as component and propulsion maintenance, and tier 3-components and parts manufacturers on rolling stocks manufacturers and supplier, rail signaling and communication, rail track components and equipment manufacturers and suppliers as system integration.

## 5. CONCLUSION

Much leading industry has earlier captured the moment conferred by IS shifted to advance the ability of their supply chain management operations. High performing industries usually have high performing IS functions. These dominant industries imply to be permitted by their IS actions to enhance their decision making and supply chain outcomes. Decision making is enhancing the base of value creation and competitive advantage. IS transformation providing an opportunity for supply chain management to advance its performance ability and furnish high-quality supply chain management and strategic information to embed decision making.

Therefore, we have presented the key component need for strategic IS for decision making in RSCM in this article. We concentrate on RSCM components as a critical element that encourages the level of IS adoption and further contributed to IS usage. Moreover, we provide valuable insight into RSCM in digital transformation through aligning the business domain with the IS domain that enables coherent strategic decision-making process. Yet, mapping strategic IS for decision making in RSCM provides direction for decision-makers to communicate and using high technology high-value outcomes in the future.

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