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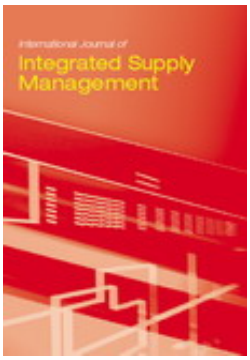

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The role of integrated coordination in supply chain performance of firms in the manufacturing industry

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Abstract: Integrated coordination plays a pivotal role in incorporating interrelated work units and various participants to enhance supply chain performance. This study focused on process, information and knowledge as integrated coordination mechanisms for managing interrelated processes between work units from the supply chain's end-to-end stages. The study's anchored theories were reviewed and research hypotheses were developed to conceptualise how process integration, information integration and knowledge integration in the cycle view and performance cycle of the supply chain is driven by integrated coordination for effective and efficient supply chain performance. Data were collected from Nigerian manufacturing firms and hypotheses were tested with the aid of multiple regression analysis. Findings from the study show that manufacturing firms in Nigeria are not practicing the end-to-end stages of supply chain integrated coordination.

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Keywords: integration; coordination; supply chain management; SCM; cycle view; performance cycle.

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1 Introduction

This current study is making steps towards analysing the crucial role of integrated coordination of interrelated work units in the chain of distribution. A chain of distribution or supply chain (logistics network) is made up of interrelated units inside and across a company belonging to both upstream and downstream members (Ballou et al., 2000; Chiu and Wang, 2019; Mpuon et al., 2020). Xian et al. (2018) delineated supply chain integration between interrelated work units of manufacturing firms as the extent through which manufacturers tactically cooperates with partners to jointly manage the processes of intra-and inter-organisational collaboration to achieve efficacious consumer experience, communication, inflow and outflow of the fund, decision-making, as well as providing the customer with maximum value at high speed and lower cost. Lezhnina and Balykina (2021) maintained that collaborative cooperation is a prerequisite to integrated SCM total quality measurement of interrelated work unit variation across firm boundaries which assist in checking the lead time, managing uncertainty in project projection, strengthening product development innovations, on-time delivery of goods and services and cost reduction, all of which are efficient and effective indicators of supply chain performance measures.

Integrated SCM, according to Hiren (2017), triggers the alignment of buyer's, suppliers, customers and their process based on integration mechanisms models which is an addition to the body of SCM based on the behavioural perspective of

inter-organisational dependency on issue domain of interrelated work units. In a similar vein, Simatupang et al. (2004) define integrated coordination mechanisms as actions that must be executed to manage interdependencies which vary among all participants in issue domains that occur to some degree simultaneously to leverage improved supply chain performance. They argued that integrated coordination mechanisms help in resolving disagreements across domains in the supply chain by clearly stating which person has the authority to add the greatest value to the customer. In the view of Hossein (2009), Yang (2014) and Simatupang et al. (2004), the existence of interconnectivity between work parts is a required criterion for integrating their processes to accomplish both the common aim of its work units and the supply chain as a whole. Integrated cooperation of interrelated processes between work units appears critical as companies concentrate on their functional areas and consider outsourcing some tasks-hence their progress depends significantly on integrated coordination of one's internal and external value chain activities beyond their borders (Simatupang et al., 2004; Degroote and Marx, 2013; Kim, 2009).

In the view of Simatupang et al. (2004), supply chain integrated coordination includes a performance measurement monitor, windows dynamic time to manage lead times, modelling ambiguity and dispute resolution. They argued that through integrated coordination a job domain disparity can be resolved by explicitly defining which members are empowered to generate the most customer value. They also maintained that integrated coordination by firms will help set joint customers value targets by encouraging participants to focus more on sales points, customer satisfaction, and potential product composition as well as delivery of products on-time. Some of the researchers like Prayogo and Olhager (2012), Flynn et al. (2010), Fabbe-Costes and Jahre (2008) and Autry et al. (2014) cited in Stevens and Mark (2016) demonstrate the supply chain consolidation importance and its significance for the success of a company, yet they argued that there is still uncertainty regarding the supply chain consolidation components. Fawcett and Magnan (2002) cited in Simatupang et al. (2004) found in their study that a significant number of the supply chain have not yet implemented consolidated coordination from the supply chain end-to-end levels. Findings from the above studies indicate that the opportunity for the improvement for firms operating in the short product cycles, highly unpredictable demand where the flow of work needs a unified view and controlled by integrated coordination (Lee, 2002; Simatupang et al., 2004).

Although diverse articles on supply chain or logistics management have been published, there seem to be very few empirical works that considered integrated coordination of interrelated work units with external partners and among functions within a firm that explicitly takes into account integrated coordination of the performance cycle and cycle view, information integration, process integration and knowledge integration. Therefore, the researchers sought to investigate this limitation by proposing an expanded model on SCM that will help managers to adopt integrated coordination and its mechanisms to effectively manage interrelated work units in the performance cycle and cycle view to improve on new products development on-time delivery and cost reduction. One of the study's significant contributions is to view integrated coordination of interrelated work units as a continuous end-to-end integration rather than one-sided integration.

This article aims to explain and establish research hypotheses for investigating integrated coordination of interrelated work units which adopts a cross-sectional survey

of Nigerian production companies. The preference of production organisations for this survey is that the sector is more in touch with a supply chain consisting of interrelated work units belonging to the downstream as well as upstream members (Ballou et al., 2000; Afolabi and Laseinle, 2019). The next segment discusses previous coordination mechanism studies as a theoretical foundation to help us set our research hypotheses and also review the anchored theories of the study. Thereafter, many other segments are prevalent studies from the investigation of cycle view, performance cycle and supply chain performance.

2 Literature review

In the assertion of Matheus et al. (2021) and Mpuon et al. (2020), the primary principle of the management of the supply chain is to unify information and production flow across activities of the supply chain which has been realised. According to Solakivi et al. (2015), the adoption of SCM necessitates the integration of operations across the supply chain which is now widely accepted as the key idea of successful supply chain management (SCM). While Chiu and Wang (2019), Zhou and Kim (2020) and Chalermpong (2019) upheld that the degree to which an organisation strategically manages intra- and inter-organisational processes and collaborates with its supply chain partners to achieve an efficient flow of services and information and products to provide maximum value to customers is known as integration of supply chain.

According to Thomson (1967) coordination is seen as the management of dependencies between activities which are characterised in three different approaches: interacting dependencies that may exist in a company as reciprocal, pooled and sequential. He established three mechanisms of general coordination as mutual adjustment, standardisation or rules, plans and schedules. Malone and Crownston (1994) reviewed the work of Thomson (1967) by developing the principle of coordination to reshape and evaluate organisations performance. The theory is based on events occurring in a cycle, activities which contribute directly to the process cycle, and also additional tasks called coordination mechanisms that have to be introduced to control specific dependency between tasks and organisational resources. Crowston (1997) also included task and resources in interdependencies that form the basis for coordination mechanism.

According to Ballou et al. (2000), the term ‘coordination’ is described as the capacity of supply network executives to consolidate associated logistics network processes throughout distinct boundaries of the organisation, responsibility and authority. Coordination, according to Ghosh (2015), is the process of combining knowledge, material, information and funds to run a supply chain. Lee (2000) submitted that SCM is a means to reshape decision rights, the flow of work as well as resources among chain partners for leveraging and improving performance. Simatupang et al. (2004) argued the synchronisation of the supply chain should be examined as a tool for accelerating a direct touch between transacting supply chain partners to actualise a bundle of shared work objectives. While Hines et al. (2000) established supplier development as a coordination model involving four stages known as, piecemeal coordination and coherent strategy. Simatupang et al. (2004) opined that there are four modes of coordination in the supply chain which include incentive alignment, collective learning, information sharing and logistics synchronisation that should occur to some degree at the same time to exploit

good performance among members. Burra et al. (2015) acknowledged coordination mechanisms for actualising SCM objectives to consist of price discounts, a quantity discount, volume discounts, trade credit and common replenishment periods. According to Kachru (2009), there exist three types of coordination across functions, across management level and channel members. Skipper et al. (2008) recognised four coordination nodes important for the establishment of any business enterprise to include logistic synchronisation, incentives alignment, information sharing and collective learning.

This complexity in the supply chain presents a lot of attracting challenges calling for a new approach to the definition and a working knowledge of supply chain integrated coordination and the numerous mechanism and model suggested by scholars as contained in pieces of literature. Based on this paradigm shift, we are tempted to suggest a new definition, new mechanisms and modes of supply chain integrated coordination in consolidation to the work of Thomson (1967), Malone and Crownston (1994), Ballou et al. (2000), Lee (2000) and Simatupang et al. (2004). In this study, we define supply chain integrated coordination as a managerial philosophy or a business process that takes into consideration the holistic nature of the supply chains cycle view, performance cycle, process cycle time and cycle time reduction. In order words, we are suggesting that the justification for the selection of supply chain coordination mechanism should be based on the premise of integrating (processes, information and knowledge) into the cycle view and performance cycle for effective and efficient supply chain performance. Premised on the above discussion, the preceding sub-sections explore this concept and introduce research hypotheses to be tested empirically using multiple regressions to assess if these constructs have an impact on product development, on-time delivery and cost reduction.

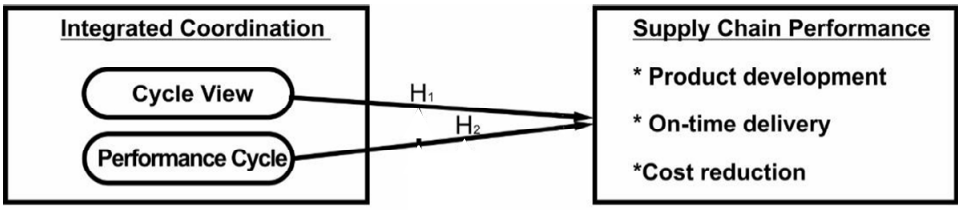
2.1 Conceptual framework and hypotheses development

The examination of previous schools of thought by scholars who theorised about integrating process, information and knowledge into supply chain cycle view and performance cycle as coordination mechanisms for effective and efficient supply chain performance would provide fundamental support for the conceptual framework presented in Figure 1. Ellram and Cooper (1990) concluded that the consolidation of major commercial operations, irrespective of the design of functional areas is a prerequisite for ultimate customer satisfaction. Towill et al. (1992) stressed that two-way communication and knowledge creation between members of the chain of supply is relevant for supply chain performance. Childrenhouse (2002) and Stevens (1989) stressed the need for inter and intra-organisational holistic consolidation in procedures and relationships. While Turner (1993) and Scott and Westbrook (1991) argued that incorporating work units helps in the linkages between the functional areas, including suppliers, manufacturing and sales which triggers integrated coordination of the performance cycle and cycle view by focusing on how the functional link sequence can be exploited for competitive advantage. Based on the above propositions we present the conceptual framework in Figure 1.

This research is rooted in the principle of resource dependence. The theory's key assumptions are the nature of coalitions, instability (fluctuation and complexity in resource acquisition) with a problem perspective based on minimising instability and managing dependence, and also the question of why firm strategic alliances are created (Emerson, 1962; Hunt and Morgan, 1996; Heide, 1974; Pfeffer and Alison, 1987). The

main goal of the theory is inter-firm reliance on substantive relationships based on resource exchange, while the primary interest area of the theory is to optimise organisational control (Hunt and Morgan, 1996). The theory of resource dependence is used as the anchored theory, other substitute theories are incorporated to match incentives, trade and transaction criteria, firm production resources and capabilities, relationships with actors who are both diverse and identical and social interaction between companies.

Figure 1 Conceptual framework



In the course of this study, managers can use resource dependency theory (RDT) as a framework for the proposed model by taking advantage of supplier's capabilities and revenues, acquiring and retaining resources, reducing environmental uncertainty associated with new product development, on-time delivery and cost reduction (Afacan, 2019). Integrating RDT into the decision making process of interrelated work units in the cycle view and performance cycle enhances organisational longevity, by encouraging mergers and acquisition of tangible and intangible resources, joint ventures, maintaining a stable atmosphere for the board of director's composition and restructuring (Hillman et al., 2019). The proposed hypotheses and their theoretical rationale are discussed in the subsequent sections.

2.1.1 Cycle view

The cycle view of the supply chain is one of the aspects of integrated coordination of interrelated work units to be analysed from a conceptual perspective. A cycle view of the supply chain describes precisely the series of stages involved as well as who owns every process, which is crucial when taking decisions operationally as it stipulates the functions and obligations of every participant in the supply chain and the end state for each cycle (Simatupang et al., 2004; Kachru, 2009). Contrary to the cycle view, integrated synchronisation of the supply chain is achieved by a set of processes and streams that occur within and across various phases and merge to address customers' demands for a product (Thomson, 1967; Ballou et al., 2000; Cooper et al., 1997; Simatupang et al., 2004). Arshinder et al. (2007) explained that integrated coordination is because the supply chain is very complex with operations distributed across the nodes of the facility resulting in successful activities related to the supply chain. Thomson (1967) came up with a model on events happening in a loop, events that correlated to the process cycle and supplementary tasks labelled integrated coordination framework that has to be introduced to manage mutual dependency across tasks and organisational resources.

Ghosh (2015) submitted that to maximise supply chain efficiency, business processes ought to be guided by integrated coordination commonly known as process integration. Atul and Satish (2007) noted that the need to strengthen integrated coordination in a

circle perspective of the supply chain, which defines the roles of each supply chain participant, depends on the process, information and knowledge integration. The key benefits of integrating coordination into interrelated work units were described as enhanced customer satisfaction, product development, on-time delivery, decreased inventory and operating costs (Stevens and Mark, 2016). Supply chain integrated coordination, according to Stevens and Mark (2016), is the synchronisation, interconnection and alignment of individuals, steps, information, insights and techniques around the supply chain and across all touchpoints and control to promote an improved stream of products, resources, ideas and expertise in reacting to customers' demands.

According to Krishnapriya and Rupashree (2014) companies have recently recognised integrated coordination as an important feature of a competitive supply chain that needs high levels of confidence, collaboration, exchange of information and knowledge amongst the supply chain allies. It is therefore necessary to build a set of expertise, knowledge and capabilities across the workforce that are necessary for the creation and realisation of organisational strategic goals and the achievement of inter-company integrated coordination for effective and efficient supply chain performance (Krishnapriya and Rupashree, 2014). A highly innovative integrated coordination of a supply chain requires an efficient workforce with the requisite organisational capabilities for internal and external functioning (Krishnapriya and Rupashree, 2014). Against the background of the foregoing discussions, we hypothesise as follows:

H1 Integrated coordination of cycle view significantly affects supply chain performance.

H1 conceptualises integrated coordination in the supply chain as a continuum element involving the creation of specifics schedule operation of each chain node through process integration, information integration and knowledge integration. This includes rapid response to customer needs, learning thinking, reverse logistics, inventory handled by suppliers and collaborative planning, forecasting and replenishment (CPFR) (Ghosh, 2015). These strategies provide many advantages for the supply chain performance, such as lead (distribution) time reliability, ability to cope with delay, manage the bullwhip effect, the ability to exchange knowledge and information, product creation capability, volume distribution and mix flexibility (Atul and Satish, 2007; Ghosh, 2015).

2.1.2 Performance cycle

The second dimension of integrated coordination to be examined is the performance cycle. The primary analytical units for supply chains are the performance cycles across the general chain of supply and connect the engaging companies (Kachru, 2009). An empirical investigation by scholars (Chiu and Wang, 2019; Chalermpong, 2019; Zhou and Kim, 2020) revealed that the performance cycle or process performance involves the coordination of a variety of actors aimed at connecting relevant business processes within and across the organisation. They argued that in a supply chain, chain members or a node's activity revolved around the process performance cycle which must be managed through integrated coordination. The performance cycle also depicts work domains that are required to execute an effective and efficient supply chain-related task. Integrated coordination mechanics (process integration, information integration and knowledge integration) tie the supplier, the firm and its customers together in the performance cycle. Simatupang et al. (2004) opined that the cycle view clearly outlines the processes

involved in a supply chain and the owner of each process which accurately describes each member of the supply chains roles and duties as well as assisting the chain designer to acquire the infrastructures needed to support the processes.

The locations which connect the performance cycle are referred to as nodes. It is at the nodes of the facility that supply chain work takes place (Mpuon et al., 2020; Simatupang et al., 2004; Lee, 2000). Integrated coordination of process, information and knowledge in the facility node as collaboration mechanisms would increase the efficiency and effectiveness of the performance cycle (Ghosh, 2015). In the assertion of Mpuon et al. (2020) and Simatupang et al. (2004) integrated synchronisation of supply chains is a way of enhancing the performance cycle by encouraging direct contact between members to achieve a set of shared objectives. They claimed that alignment of the performance cycle relates to the degree to which participants are interested in entering decision making, such as addressing competing priorities, reducing confusion, redesigning work processes and allocating resources. In addition to integrating processes, information and knowledge, the participating actors work together in the facility node to find alternative solutions to problems encountered.

In the views of Ghosh (2015) integrated coordination of process, information and knowledge into cycle performance involve cooperation between internal functions and outside firms. Integrated coordination from an internal perspective reduces running costs, encourages the rapid distribution of goods, stimulates new product development concepts, increases process efficiency and assists in external teamwork. Many organisations adopting integrated supply chain coordination seek to consolidate logistics, marketing and operational activities that are linked to the performance cycle across supply chains (Atul and Satish, 2007; Ghosh, 2015). According to Kachru (2009), the performance cycle represents the requirements of input or output, the input into a performance cycle is an order identifying the specifications for the item or resource whereas device output is the performance point anticipated from the supply chain process. The allocation of the resources needed to obtain productivity in the chain of supply is expressed in the performance cycle. The performance cycle can be managed by a single company or involve multiple companies depending on the target that requires integrated coordination of process, information and knowledge management for effective and reliable supply chain performance (Kachru, 2009). Against the backdrop of the preceding discussion, we hypothesised as follows:

H2 Integrated coordination of the performance cycle significantly impacts supply chain performance.

Simatupang et al. (2004) and Lee (2002) submitted that integrated coordination extends cycle performance to include consumer dynamics such as quantity and delivery schedules, product type, brand combination, distribution styles, price as well as marketing communication. The bond between a company's structures can be seen as a sequence of coordinating nodes that erupt through time across the product placement interface from the moment where consumer demands are recognised to product distribution. This pooled workflow has to be controlled through integrated coordination and breaking down the key process into many operations within a company creates coexistence between work units.

2.1.3 Supply chain performance

Ambe (2014) cites Taylor (2004) stipulating that supply chain performance measures are critical instruments for measuring and optimising supply chain efficiency to obtain a distinct advantage. Performance metrics help in SCM strategies by providing important long-term decision information (Ambe, 2014). According to Wisner et al. (2012), supply chain performance connects members of the supply chain in a way that enables them to accomplish improvements in meeting ultimate customers' requirements by providing feedback on clients' needs and capacities of the distribution network. While Lee and Kwon (2007), Gyaneshwar (2012) and Krishnapriya and Rupashree (2014) submitted that the effectiveness of supply chain can be measured in various dimensions, including cost, quality, product development, delivery, flexibility and reliability. Based on the above submission, the measures of supply chain performance that impact supply chain integrated coordination includes; product development, cost reduction and on-time delivery.

Product development can be described as the design of new or improved products and services for the prime purpose of maintaining or improving a company's overall market position (Kalu, 1998). Integrated coordination of the cycle view and cycle performance of supply chain encourages innovation of new products and the modification of existing products as firm's powerful growth techniques resulting in information sharing, collaboration and alignment of organisations to develop and market new products. Integrated coordination of processes, information, and knowledge of interrelated work units and partners along the supply chain will help companies overcome some challenges to product development like; adequate market analysis, adequate cost analysis, strong competitor response, low product awareness and corporate level changes in strategy (Henrick et al., 2017; Yeon-Hak et al., 2016). Integrated coordination of product development may involve modification, a fresh presentation or composition of an established product that meets a newly defined consumer or market need (Henrick et al., 2017).

Cost reduction, on the other hand, involves operational improvements implemented to optimise productivity and performance in the production chain by reducing cost for none – value-added operations and ultimately raising net income. Industries today strive for supply chain integrated coordination to minimise and eliminate waste through a continuous process, information and knowledge improvement strategy that allows for improved efficiency in the manufacturing process while preserving quality and serving the customer within. Cost management techniques are required to be major components of the consolidated coordination of supply chain planning that can result in a profit-making venture for those firms who want to stay in business, especially in the current downturn, as no company can remain in business unless it put a specific mechanism in place to its costs so that the expenses do not surpass the projected costs. The absence of integrated coordination in cost control management in the supply chain is the main reason for the biggest weakness and deficiencies in raising the main cost elements. If expenses are not thoroughly checked in the cycle view or performance cycle of a chain of supply, the outcome can be disadvantageous to the business' overall stability. Companies must follow the forecast and real cost and strive to ensure that they are all within the scope of the projected forecast.

However, the notion of timely delivery tests effectiveness by way of smooth delivery and quality of customer service, a combination of delivery reliability and timeliness, a

triplet phenomenon is known as timely order filling (Gunasekaran and McGaughey, 2003). According to Igwe et al. (2016), the number of all request items fulfilled on or before the accepted delivery date is known as on-time delivery. They opined that on-time delivery is achieved by initiating integrated coordination strategies in the cycle view and cycle performance in the supply chain, particularly when collaborating and sharing information with supply chain partners concerning customer's articles delivery, material or production schedule, the flow of information and funds concerning sales, inventory replenishment of organisations and order processing. The on-time delivery cycle is one of the biggest problems that businesses still have weaknesses in, and most of them have struggled to calculate how their companies will achieve delivery success and how feasible it can be measured (Kamola, 2020).

2.2 Theoretical review

According to Mpuon et al. (2021), effective research is based on proven theory. To advance a discipline ahead of the pre-paradigmatic stage and to be regarded as a full-fledged profession, it has to grow and build theory. This research work is anchored on the resource dependence theory. In the assertion of Mpuon et al. (2021) and Arni et al. (2007) when analysing occurrences in SCM, we cannot rely on a single theoretical explanation. To present a more comprehensive understanding of SCM, we must analyse many theories and how they complement one another. We can choose a theory and then supplement it with one or more alternative theoretical perspectives depending on the situation.

The RDT entails a set of power relationships that are based on the exchange of resources. This acknowledges that business does not have all the resources they may need in the value-creation process, and they will always rely on each other (Emerson, 1962; Pfeffer and Alison, 1987; Hunt and Morgan, 1996 cited in Sillanpaa and Sebastian, 2014). The major problem then is how an organisation controls its relationships of power-dependence to maintain its functional and organisational demands. RDT believes that organisations frequently create partnerships intended to enhance their influence and cause other organisations to depend on them. Manipulation and management of resources are strategies provided by RDT for managing volatility and dependence on business transactions (Heide, 1974). Afacan (2019) argued that firm success is connected to the composition of resources and capability dependencies as a market grow. Hillman et al. (2019) maintained that inter-organisational contacts on the other hand aid in the facilitation and acceleration of new products development, cost-effectiveness and increase customer service in delivering goods and services as a result of individual businesses learning how to reduce environmental uncertainty in resource use through the process, information and knowledge integration in the cycle view and the performance cycle by adopting integrated coordination. In the assertion of Hillman et al. (2019) and Aldona and Symantec (2012) this type of linkage is more than just output, is about resources exchange, usage and the necessity of obtaining resources possessed by stakeholders that drive an organisation's efforts to create relationships with key organisations that will increase trust, confidence and the integrity of actors that prevent such organisation from refusing to make their resources available for collaborative cooperation. According to Afacan (2019), firms form strategic collaborations to reduce their environmental dependencies and uncertainty while focusing on negotiating

dependency relationships. When relationships are correctly managed, they have the potential to improve a company's supply chain efficiency (Chalermpong, 2019).

While resource-based view theory (RBV) is a multi-disciplinary mechanism built on a fundamental drift in thinking. This is because the theory was based on the foundations of promotional strategies, economics, law, logistics network, general business, and ethics (Hunt, 2013). The theory of resource-based view argues that long-term competitiveness comes from enhanced proficiencies and resources (Barney, 2001). The theory stresses that resources within the firm are key to its ability to acquire competitive capabilities (Prahalad and Hamel, n.d. cited in Wikipedia, n.d.). The theory will enable manufacturing companies in Nigerian to develop and effectively coordinate their material and immaterial resources and competencies. Afacan (2019) opined that RBV facilitates a protracted shared commitment and adjustments, as well as tailored rather than generic solutions, which enhances the uniqueness and heterogeneity of supply chin resources and capabilities that can drive innovation in firms interrelated work units using integrated coordination and its mechanism that regulates the cycle view, performance cycle, and other factors.

On the other hand, power view theory (PVT) is the most important view of psychology-based strategic management have been the power views, which considers strategy configuration as a political means in connection with the concept of patterns which affirm that strategy is consistent in past behaviour and not as a plan pre-described. Managers are constrained and enabled through adversaries when formulating strategy in SCM. This kind of social battle between various groups with different strengths forms the actual phase of strategic management (Romos-Rodrique and Ruize-Navaro, 2004; Mintzberg et al., 2009 cited in Sillanpaa and Sebastian, 2014). The belief that strategy is more a perceived trend in the past than a fixed path for the future is based on criticism on the basis for active strategic planning – the possibility of predicting the future. Empirical evidence indicates that strategy arises from weakly organised decisions of several members of the organisation (Noda and Bower, 1996, Grant, 2003 cited in Sillanpaa and Sebastian, 2014).

Also, transaction cost analysis (TCA) is required for an exchange to occur. There are tangible assets that are necessary to carry out the functions of distribution. TCA provides a prescriptive financial strategy used to evaluate the limits of the company's which may be adopted to portray output as a reason for contracts among organisations (Williamson, 1975, 1985, 1996 cited in Arni et al., 2007). TCA has also been used in the supply chain in produce-or-buy decisions. Examples include logistic activities such as outsourcing, restructuring of the supply chain and buyer-supplier relationships decisions (Arni et al., 2007). TCA is a valuable method for determining if a transaction should be carried out in the marketplace or internally. In view of Arni et al. (2007), TCA strengthen, the relationships of key actors in interrelated work units by engaging supply chain actors into long-term cooperation that help in lowering transaction costs that trigger innovative product creation effectiveness, effective customer service, and on-time delivery of goods after the deal has been negotiated.

Furthermore, network theory (NT) suggests that networks of communication typically include multiple partnership decisions taken by supply chain actors representing several firms at various levels and within the firm. NT analyses the wider system in which supply chain partners function and the importance of concepts such as network centrality for supply chain efficiency contact authority and contact capacity are given adequate viewpoints (Watson et al., 2015). According to Arni et al. (2007), NT encourages

openness and trust between parties involved in new products development and the delivery of goods and services on the schedule that leads to customer satisfaction which is achieved through mutual adjustment that improves integrated coordination in the cycle view and performance cycle over time.

While principal-agent theory (PAT) aims to clarify the challenges faced by companies as a result of separating owners of the business from managers and finding solutions to these problems. The theory tries to formulate methods for addressing the specific governance structures, laws and enforcement of their contractual agreement with regards to regulating the conduct of an agent with the principal (Arni et al., 2007). Arni et al. (2019) argued that by focusing on the formation of successful contracts between stakeholders in interrelated work units, PAT supports inter-firm contracting to the supply chain in terms of productivity, new product development, timely delivery, and customer satisfaction.

The above theories offer a background for understanding the strategic, organisational network, operational mechanisms and behavioural aspects of supply chains as well as their subsequent management behaviours, incorporated into a systemic structure showing the essential components of the SCM discipline. These theories provide managers with the ability to assess their actions to determine if they were centred on intuition or evidence through the model provided in Figure 1 to understand the relationships between their methods of the supply chain (i.e., performance, market risk, resilience, and agility) and internal and external activities of companies. These theories and models were combined because theories can clarify the associations between concepts, and models, hence they can help understand supply chain operating character. The theories and models demonstrate bilateral ties that explain the effect of strategies on behaviour, interconnections, and procedures, as well as how they may be manipulated to promote the execution of strategies.

2.3 Empirical review

There are few studies carried out relating to the integrated coordination of integrated work units and supply chain performance. Simatupang et al. (2004) use a case-research method and data collection from Almanda, a nationwide Indonesian fashion firm to examine and compare supply chain coordination between practice and theory. Findings show that Almanda participated in fragmentary synchronisation rather than comprehensive collaboration to identify and meet client needs. From the notion of customer demands through demand fulfilment, there was a lack of uniform expectations on end-to-end distribution network planning and execution (product delivery). According to the findings, the needs of customers between divisions are likely to be distorted.

Ghosh (2015) investigated the 'Role of responsiveness and process integration in supply chain coordination' using a heavy equipment manufacturing industry to demonstrate the challenge of a smoothly integrated supply chain and the degree of process integration depending on how well the chain member's activities are coordinated. The study findings revealed that information and knowledge sharing in real-time would minimise lead times and also help to reduce problems with process integration.

Stevens and Mark (2016) explored 'integrating the supply chain 25 years on' by formulating two extra supply chain integration operational models that companies can apply to enhance the efficacy of the distribution network. The findings of the study

revealed for a company to attain the consolidation level it seeks; it must advance through a series of processes and that reaching absolute internal consolidation involves a smooth passage through the internal chain of supply. They concluded that the key advantages of consolidation included better customer service and decreased costs of inventory and operations.

Gyaneshwar (2012) investigated 'operational performance through SCM practice' adopting paired samples T-test and multiple regression analysis by collecting data from Indian paint companies. Findings from the study showed that capabilities help a company to set itself out from its rivals, which comes as a result of key managerial choices. Existing studies were consistent in the identification of quality delivery, flexibility, and price/cost as important competitive capabilities.

According to Krishnapriya and Rupashree's (2014) assessment on 'supply chain integration – a competency-based viewpoint', integration across supply chain partners can be challenging and include specialised competencies (skills) that can be costly or difficult to reproduce, which supports our argument. The study concluded that the competence-based strategy relies based on defining critically the behaviours necessary for individual organisational performance and extending even further to the inter-company performance by harnessing the capabilities superior performance.

Ambe (2014) used exploratory and descriptive surveys involving both qualitative designs to analyse 'primary indicators for optimising supply chain performance' in South Africa. The result showed that, generally, quality emerged as the most significant performance variable, after the reliability of distribution strategy, cost and dependability of the supplier in optimising the performance of the supply chain. The result further demonstrates that all the indicators are necessary to maximise supply chain efficiency.

Atul and Satish (2007) investigated 'domain of SCM – a state-of-the-art' which indicates that the logistics consolidation-making interface does not result in cost reductions, lead times and stock-outs. They noted that integration achieve in the production interface and the logistics enhance these performance metrics while there is no third-party connectivity; however, the internal cooperation between supply chain participants also leads to the development of company's logistics performance.

Arshinder et al. (2007) studied the 'role of supply chain coordination in Om. Selected Indian experiences' using an analytical approach focused on case studies to examine and explore various opportunities for coordination in the Indian context. Findings from the analysis showed that supply chain coordination is a strategy for coping with ambiguity and uncertainty. Supply chain coordination was presented as a system for relinquishing workflow, decision rights, and resources among participants to improve their performance in terms of higher profitability, better customer service, and faster reaction time, according to the study.

Burra et al. (2015) investigated 'supply chain coordination model: a literature review' considering 124 papers written from 2000 to date. The literature is checked and graded as three-level models and two-level models which are further discussed based on a few coordination tools such as revenue sharing, trade credit, contract and information sharing, and quality discounts.

The study of Sohail et al. (2009) on strategic supply chain integration and its impact on organisation performances perspective from an emerging nation determine the fundamental components of logistics network collaboration of the firms operating in Saudi Arabia. The scope and character of supply chain integration, as well as its relationship with organisational success, were studied through empirical research.

According to the finding from data analysis in any case, environmental uncertainty hurts supply chain integration, whereas organisational strategy has a favourable impact on supply chain assimilation. Related investigations on the association between business performance and supply chain assimilation or integration were also highlighted in the study. Meanwhile their finding has ramifications for businesses creating and managing relationships with supply chain partners

The investigation of Solakivi et al. (2015) on the topic supply chain cooperation and firm performance in manufacturing sustained that 'supply chain collaboration' is a term used to define a method of integrating corporate activities upstream and downstream of the supply chain. They argued that information systems are often critical enablers of joint operations. Their report gives empirical evidence on the correlation between support for a company's performance and systems engineering and supply chain collaboration. Data were acquired from 26 industrial companies in Finland and combined with financial reporting data, correlation analysis, confirmation component analysis and generalised models were used to examine the dataset. The findings from the results of the study suggested that enhanced supply chain collaboration is linked to effective fiscal results and lower logistics costs. The author also suggested from the findings that practitioners should target supply chain collaboration instead of technological capabilities of their information systems.

The above studies failed to identify the causal relationship of organisational efficiency of supply chain integrated coordination strategy across operational capabilities of interdependent work units especially concerning product creation, on-time delivery and cost reduction. Additionally, these studies are constrained on review of the literature and single case studies which findings cannot be generalised. Our study is conducted on these assumptions based on a cross-sectional survey design using multiple regression analysis to gain more proof and provide a more comprehensive understanding of the role of integrated coordination in the integration of interdependent work units.

3 Method

A quantitative cross-section survey of 800 manufacturing firms was adopted for this study using convenience sampling techniques to meet the analysis of the research objectives. This design was selected because the researchers made no effort to control extraneous variables as obtainable in experimental research. The sampling structure of the study included all manufacturing firms quoted in Nigeria's Stock Exchange or registered with Nigeria's corporate affairs commission formed in 1990 based on Allied Matters Act No. 1 1990 as amended. The sample size is composed of 40 explicitly selected firms from the 800 firm's survey. These firms were selected because of the spread of their activities with the downstream and upstream supply chain participants. The instrument labelled integrated coordination survey questionnaire (ICSQ) was utilised to capture data. That instrument was categorised into three parts, A, B and C. Part A comprises five items on the demographics of the respondents (gender, age, educational qualifications, marital status and years of experience). Part B is comprised of 20 items on independent variables (cycle view and performance cycle). While part C comprises 11 items on the dependent variable (supply chain performance). Supply chain performance was gauged using product development, cost reduction and on-time delivery. All items on

the instrument excluding the demographics of the respondents were rated on five points scale of strongly agree, agree, disagree, strongly disagree and neutral which were scored 4, 3, 2, 1 and 0 respectively. The instrument was validated by three experts in marketing, and two experts in Tests and measurements all from the University of Uyo, Uyo. The instrument's dependability was assessed using the Cronbach alpha coefficient reliability testing administered to 15 employees of manufacturing firms in Nigeria who are part of the main population but do not take part in the main study. The results yielded a reliability coefficient of 0.821 for cycle view, 0.842 for performance cycle, and 0.855, 0.812, 0.897 for product development, cost reduction and on-time delivery respectively. The entire scale yielded a reliability coefficient of 0. 879, therefore the instrument was considered reliable. Frequency, percentage and multiple regression were used to analyse the data facilitated using the Statistical Package for Social Sciences (SPSS version 23).

Appropriate data was collated using a hybrid of the site visit and structured questionnaires. 600 questionnaires were given to the 40 purposely isolated firm's employees. The definition of the questionnaires to be administered was built based on the quality of the research hypotheses. The questionnaires were checked at the firms on the informant to ensure materials consistency, accuracy and ease of use. The respondents were known in their different companies by their classification/explicitly obligations. The study purpose was clarified to the respondents, and they were also given a written guarantee of anonymity and confidentiality of answers (in the form of cover letters).

The data were obtained in two steps: first, the groups, business development managers and brand managers were interviewed using a structured questionnaire because their impressions correctly defined the firm position based on their higher-level and deep knowledge of the firm. A structured questionnaire was adopted to obtain the general opinions of the senior management and core issues of integrated coordination in SCM. Following regular visits and reminders (using telephone calls and text messages) to participants at the organisational level such as supply chain manager, store administrative staff, procurement assistants, graphic designers, purchasing assistants, production and marketing managers, and quality control managers, 415 filled questionnaires, depicting a 69.2% respondents were retrieved. 24 questionnaires showing a response rate of 4% were considered unsuitable for inclusion in the analysis after testing for completeness of the responses, resulting in a modified sample size of 391. The summary of reliability coefficients is illustrated in Table 1.

Table 1 Summary of Cronbach's alpha reliability results

Variables	*N*	*k*	*SD*	*Reliability coefficient*
Cycle view	15	9	5.23	0.821
Performance cycle	15	9	4.62	0.842
Product development	15	4	3.57	0.852
Cost reduction	15	4	4.84	0.812
On-time delivery	15	4	4.28	0.895
Entire scale	15	30	9.72	0.879

Notes: n – number of respondents; k – number of items.

4 Results

The result in Table 2 presents the demographics of the respondents. The study reveals that 53% of the participants were male and 47% were female. In terms of their age distribution, 23.5% of the study participants were between age brackets 26–30 years, 28.7% were between age categories, 31–40 years while 22.3%, 15.3% and 10.2% of the respondents were between age groups 41–45 years, 46–50 years and 51 and above years respectively. Result also shows that 72.1% were married and 27.9% were single with 24.1% of the respondents having less than 5 years of working experience while 29.9%, 20.5%, 10.7% and 14.8% of the respondent had 6–10 years, 11–15 years, 16–20 years and 20 and above years of working experience respectively.

Table 2 Demographics of the respondents

Demographics variables	*No. of respondents*	*Percentage (%)*
Gender		
Male	206	53
Female	185	47
Total		
Age (years)	391	100
26–30	92	23.5
31–40	112	28.7
41–45	87	22.3
46–50	60	15.3
51 and above	40	10.2
Total		
Qualification	391	100
PhD	45	11.5
MSc	57	14.6
BSc	180	46.0
HND	109	27.9
Total		
Marital status	391	100
Married	282	72.1
Single	109	27.9
Total		
How long have you been working with the company	391	100
Less than 5 years	94	24.1
6–10 years	117	29.9
11–15 years	80	20.5
16–20 years	42	10.7
20 and above years	58	14.8
Total	391	100

The result of the descriptive statistics for the research variables is presented in Table 3. The descriptive statistics include the mean and standard deviation, minimum,

maximum, kurtosis and skewness. The result shows that the mean score of 14.91, 13.78, 9.22, 9.57 and 9.10 with standard deviations of 2.66, 2.53, 2.54, 2.54 and 2.61 for cycle view, performance cycle, product development, cost reduction and on-time delivery respectively. The kurtosis of 5.39, 6.74, 4.85, 3.23, and 5.77 were obtained for cycle view, performance cycle, product development, cost reduction and on-time delivery respectively and skewness of 1.92, 1.34, 1.98, 1.60 and 2.33 were obtained respectively. The skewness obtained were all greater than 0 meaning that the variables were all skewed to the right with kurtosis obtained for cycle view, performance cycle, product development, cost reduction were greater than that of the normal distribution while that of on-time delivery was less than that of the normal distribution. The normality of the scores obtained on each of the variables using the Shapiro-Wilks test are illustrated in Table 4.

Table 3 Descriptive statistics for the scores obtained on the research variables

	n	*Minimum*	*Maximum*	*Mean*	*Std. deviation*	*Skewness*		*Kurtosis*	
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Statistic*	*Statistic*	*Std. error*	*Statistic*	*Std. error*
Cycle view	391	9.00	29.00	14.9122	2.66221	1.915	0.352	5.390	0.674
Performance cycle	391	9.00	29.00	13.7787	2.52911	1.336	0.352	6.741	0.674
Product development	391	4.00	17.00	9.2222	2.53661	1.984	0.352	4.848	0.674
Cost reduction	391	4.00	22.00	9.5658	2.54228	1.604	0.352	3.231	0.674
On-time delivery	391	4.00	19.00	9.1046	2.61233	2.331	0.352	4.777	0.674

Source: Researchers computation with SPSS 20

Table 4 Summary of normality test using Shapiro-Wilk test for the research variables

	Shapiro-Wilk		
	Statistic	*Df*	*P-value*
Cycle view	0.742	391	0.000
Performance cycle	0.711	391	0.000
Product development	0.770	391	0.000
Cost reduction	0.739	391	0.000
On-time delivery	0.788	391	0.000

Source: Author's computation (2019) using SPSS version 20.0

The P-values for cycle perspective (P-value = 0.000), performance cycle (P-value = 0.000), product development (P-value = 0.000), cost reduction (P-value = 0.000), and on-time delivery (P-value = 0.000) are all less than 0.05 (P0.05), as shown in Table 4. This means that none of the research variables was regularly distributed. Regression analysis is run on the assumption of normality, it was necessary to log transform the data (log 10) to make them normal. The summary result of the relationship between cycle view, cycle performance and supply chain performance is presented in Table 1.

The result presented in Table 5 shows multiple coefficients of determination of 0.363, meaning that 36.3% of the variability in supply chain performance was accounted for by integrated coordination of cycle view, integrated coordination of cycle performance. To examine whether there is a presence of autocorrelation, the Durbin Watson test was used and the result yielded Durbin Watson statistic of 1. 773 was obtained which is greater than 1 and less than 3.00 meaning that there is no evidence of autocorrelation. Result of the analysis of variance (ANOVA) showing whether there is a regression correlation between the dependent (supply chain performance) and independent variables (cycle view and cycle performance) is presented in Table 2.

Table 5 Model summary for the relationship between integrated coordination of cycle view, integrated coordination cycle performance and supply chain performance

Model	*R*	*R-square*	*Adjusted R-square*	*Std. error of the estimate*	*Durbin-Watson*
	0.602	0.363	0.334	6.17568	1.773

Source: Author's computation using SPSS version 23.0

Table 6 presents the ANOVA result for the regression. The F-calculated of 12.809 was derived with a P-value of 0.000 as against the F-critical of 3.20 at 0.05 significance level. The result shows that the F-calculated (12.809) is greater than F-critical (3.20) signifying that there is a substantial difference in regression correlation between the dependent (supply chain performance) and independent variables (cycle view and cycle performance). Parameter estimates of the multiple regression models, as well as the significance of each of the parameters in the multiple regression models, are as presented in Table 3.

Table 6 ANOVA result of the multiple linear regressions showing the relationship between integrated coordination of cycle view, cycle performance and supply chain performance

Model	*Sum of squares*	*Df*	*Mean square*	*F-calc.*	*F-crit.*	*P-value*
Regression	977.059	2	488.529	12.809	3.20	0.0000
Residual	1,716.254	45	38.139			
Total	2,693.313	47				

Source: Author's computation (2020) using SPSS version 23.0

Table 7 Parameters estimates of the multiple regressions for the relationship between cycle view and cycle performance and supply chain performance

Model		*Unstandardised coefficients*		*Standardised coefficients*	*t-cal.*	*Sig.*	*Collinearity statistics*	
		B	*Std. error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	4.789	4.132		1.159	0.253		
	Cycle view	0.631	0.261	0.315	2.418	0.020*	0.836	1.196
	Cycle performance	0.801	0.259	0.402	3.087	0.003*	0.836	1.196

Note: *significant at 5% ($P < 0.05$). T-critical = 2.01.

Source: Author's computation (2020) using SPSS version 23.0

The result in Table 7 presents parameters estimates of the regression for the relationship between cycle views, cycle performance and supply chain performance. Variance inflation factor (VIF) of 1.196 and 1.196 were obtained for cycle view and cycle performance with tolerances of 0.836 and 0.836 respectively. The tolerances were all greater than 0.1 while VIFs were all less than 10 indicating that there is no evidence of multi-collinearity. Result reveals that the cycle view shows a considerable positive link with supply chain performance ($\beta = 0.632$, t-calc. = 2.418, P-value = 0.020, $P < 0.05$). The alternate hypothesis is therefore accepted meaning that there is a significant association between supply chain performance and cycle view. Similarly, result indicates that performance cycle has a significant interrelationship with supply chain performance which is positive ($\beta = 0.801$, t-calc. = 3.087, P-value = 0.003, $P < 0.05$). The alternate hypothesis is accepted and therefore the association between the performance cycle and the performance of the supply chain is significantly positive. These results indicate that if the cycle view and performance cycle is well integrated and coordinated, it will help enhance the supply chain performance of manufacturing firms.

5 Discussion of findings

Conceptualising integrated coordination of cycle view and supply chain performance, the multiple regression test of hypotheses revealed that the correlation between cycle view and the performance of the supply chain dimensions (product development, on-time delivery and cost reduction) was very significant. These assertions are supported by the following studies (Ghosh, 2015; Stevens and Mark, 2016) opined that process integration, information and knowledge sharing would help to reduce problems with product development, delivery and cost reduction. They noted that the key benefits of integrated coordination were defined as better customer service, decrease inventory and operation cost.

In conceptualising integrated coordination of the performance cycle, the multiply regression test of hypotheses shows a significant association exists between the performance cycle and supply chain performance components (product development, delivery and cost reduction). These assertions are supported by the following studies (Simatupang et al., 2004; Atul and Satish, 2007) that integrated coordination of processes, information and knowledge foster cooperation between internal and external functions which help in reducing running costs, stimulate new product development, increase process efficiency and assist in teamwork. They submitted that participatory members of the supply chain procedure will achieve a set of share work objectives that creates co-existence between work units.

The size and type of the industry was not controlled in this research because the questionnaire employed in this study did not capture certain crucial variables for such classifications, like the number of employees, the amount of money invested, small, medium or big, primary, secondary of tertiary industries were not taken into consideration.

6 Theoretical, managerial and research implications

This study, therefore, uses multiple linear regressions, ANOVA to show statistical correlations between the roles of integrated coordination in supply chain performance. The study verified the results of previous researchers such as Simatupang et al. (2004), Ghosh (2015), Stevens and Mark (2026), Gyaneshwar (2012), Ambe (2014), Atul and Satish (2007), Krishnapriya and Rupashree (2014) and Burra et al. (2015) that integrated coordination has a positive impact on supply chain performance in terms of product development, on-time delivery and cost reduction. Therefore, this study is in conjunction with the RDT, RBV and other theories used in this article.

The RBV and the RDT supports TAC and other theories used in this study by taking into account the resources, capabilities and competencies within the independent organisations and the relations between the supply chain companies.

While the theoretical outcome of this hybrid strategy to supply chain managers is that we cannot depend on one conceptual interpretation when evaluating phenomena in SCM. We need to acknowledge many concepts to have a more detailed view of the management of the supply chain as well as how these ideas should support one another. Regardless of the specific scenario, one theory may be selected as the predominant explanation theory and either matched by several other theoretical perspectives. The six theories chosen in this article are backed by scientific proof mainly provided by the literature, in both general and to some degree within SCM.

7 Conclusions and recommendations

The point of departure for our survey concerns was perhaps the attempt to answer two research propositions on how organisations can improve on new product development, how their products can be delivered on-time to customers and how to decrease operation costs to remain profitable and also maintain a sustainable competitive advantage in line with our proposed theories. These issues are relevant as many decisions makers in business practice as well as in academia discuss these issues more frequently than thinking about new possible interpretations of the phenomenon of inter-organisational management of the transition flows between product and consumption. We have made a coherent argument focused on behavioural theories to address our inquiries, which can be seen as an effort to minimise the distance between research and practice and established conceptual definitions and explanations. Furthermore, we have established a basic conceptual framework that incorporates the managerial SCM domain with six different organisational theories to describe our two hypotheses, and we have used our framework to analyse three different SCM problematic areas; product development, on-time delivery and cost reduction.

We recommend that Supply managers should adopt integrated coordination to effectively manage the cycle view and the performance cycle to improve on new products development, on-time delivery and cost reduction.

8 Limitations of the study

The data collection and analysis in this study were constrained since it could not account for intervening effects of significant variables including industry types, size and technology adoption. These variables may be included in comparable models in future investigations to account for their confounding effects. Furthermore, this study was conducted in Nigeria, and geographical consideration in other nations was not taken into account, which should be addressed by future researchers by replicating this study in other countries in other to generalise the findings. This study should also be conducted in the service industry by future researchers.

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Appendix

Measurement items

Integrated coordination survey questionnaire

Hello, thank you for accepting to participate in this survey. Be assured that your response would be kept confidential, and used solely for research purposes.

Please kindly tick the box in the question number of your chosen options.

Q1	Gender	
	Male	□
	Female	□
Q2	Age (years)	
	26–30	□
	31–40	□
	41–45	□
	46–50	□
Q3	Qualification	
	PhD	□
	MSc	□
	BSc	□
	HND	□
Q4	Marital status	
	Married	□
	Single	□
Q5	Years of experience	
	Less than 5 years	□
	6–10 years	□
	11–15 years	□
	16–20 years	□
	20 and above years	□

Cycle view integrated coordination	
Q6	With integrated cycle view coordination, the company will respond swiftly to customers' needs.
Q7	In your company, integration of interrelated work units with specific operating schedules for each chain node is achievable with (process, information and knowledge integration).
Q8	Learn thinking is possible with cycle view integrated coordination in your firm.
Q9	In a firm, reverses logistics practice is facilitated by cycle view integrated coordination.
Q10	With the aid of integrated coordination, mutual dependence across tasks and organisational resource is easily managed.
Q11	Cycle view integrated coordination enhanced customer's satisfaction, product development, on-time delivery and reduced cost in your firm.
Q12	Your company will respond quickly to the external environment, competitive pressure and organisational capabilities with integrated coordination.
Q13	Responsibility inter-dependence of inter-related work units between two or more actors is possible with integrated coordination.
Q14	Interface agreement and decision making regarding product development, on-time delivery and cost reduction can be activated through cycle view integrated coordination.
Q15	Integrated coordination stimulates the development of new products, reduce running costs and encourage the prompt distribution of goods and services.
Performance cycle integrated coordination	
Q16	Performance cycle integrated coordination explicitly exposed and resolved an inter-functional conflict.
Q17	With performance cycle integrated coordination, it is possible to cope with uncertainly, improve demand forecast accuracy, decreased lead times, use appropriate safety stock and increase replenishment capability in other to match demand and supply.
Q18	With performance cycle integrate coordination, where the task is highly uncertain, participating actors can rely on learning that facilitates changes in role allocation, schedules and priorities.
Q19	Performance cycle integration coordination creates co-existence between work units.
Q20	The performance cycle integrates coordination considers inter-functional conflict.
Q21	With the performance cycle integrated coordination, participating actors can work together to identify sources of conflict and device instruments to overcome disagreement.
Q22	Experiences and concerns can be shared in a cross-functional meeting that generates mutual respect and understanding.
Q23	The vagueness of authority, disagreement in performance measures and incentives are handled with performance cycle integrate coordination.
Q24	Roles of responsibility ambiguity and differences in perception is reduced with performance cycle integrated coordination.
Q25	Achieving a set of share work objects by reducing confusion, redesigning work processes, allocating resources, reducing running cost, stimulating new product development and encouraging on-time delivery is trigged by performance cycle integrate coordination.

	Supply chain performance
Q26	Price uncertainly and demand uncertainly is pegged by supply chain integrated coordination of (process, information and knowledge).
Q27	Delivering uncertainly is better managed through cycle view and performance cycle integrated coordination.
Q28	Quality and tasks uncertainly concerning product development are managed by integrated coordination of (process, information and knowledge).
Q29	Customer's needs, merchandise mix, quality and delivery plans are achievable by cycle view and performance cycle integrated coordination.
Q30	Different perceptions of the quality of samples, ambiguity of decision-making authority concerning outsourcing and sourcing decisions are better managed through integrated coordination of inter-related work units.
Q31	Work board, specifications and samples concerning product development are enhanced through integrated coordination.
Q32	Orders mix, volume, quality, prices, and just-in-time receiving from suppliers, just-in-time inventory replenishment is affected by cycle view and performance cycle integrated coordination.
Q33	Managing the bullwhip effort is possible with integrated coordination of (process, information and knowledge) in the cycle view and cycle performance.
Q34	With cycle view and performance cycle integration, your form will be able to cope with the delay.
Q35	With integrated coordination ability to exchange knowledge and information is possible.
Q36	Integrated coordination of process, information and knowledge in the cycle view and performance cycle encourages product creation capability, volume distribution and mix flexibility.