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## Study Supply Chain Integration to basic Metal Industry

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**Keywords:** *supply chain: basic metal industry: supply chain integration: global supply chain: supply chain leadership: logistics.*

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# Study Supply Chain Integration to basic Metal Industry

Alie Wube Dametew <sup>α</sup>, Birhanu Beshah Abebe <sup>σ</sup> & Frank Ebinger <sup>ρ</sup>

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**Results:** Our study investigates, key factors of supply chain integration are Technology, information shearing and information technology, Collaboration, cooperation and integration, way and level of supply chain integration and belief affect the overall capacity and performance of the supply chain integration. Also, effective and efficient resource utilization, information shearing, supply chain coordination and cooperation, highly bonded supply chain integration, adopting appropriate technology, fully supply chain system (Internal, customer & supplier), are improve quality, trust, market shear and the overall performance of the Supply chain Industries.

In addition to the above supply chain integration involves, Innovation and technology transfer, Social and Environmental responsibility, Supply chain leadership (Leader), on industrial safety and Occupational health, Environmental sustainable performance, political issue will into consideration and need further researches.

**Keywords:** supply chain: basic metal industry: supply chain integration: global supply chain: supply chain leadership: logistics.

## I. INTRODUCTION

Industrial growth is starts and begin by the growth and development of metal Industries. Metal industry is a backbone of most other Manufacturing industries for economic growth and development for the country. The Industrial Revolution created a demand for metal parts used in machinery. This led to the development of several machine tools for cutting metal parts. To built and the, installing, building and construction of new manufacturing industry (lather, textile, metal, Agro

processing industry) use metal product machinery and equipment. Metal industries considered as Key Enabling Technologies (KETs) provide the basis for industrial growth and innovation in a range of products across all industrial sectors and also drive the development of entirely new industries. The developed and developing nations, rapidly growing in deferent sectors like electric power generation, Agro processing industry, railway developments and booming housing and condominium constructions requires huge tons of steel production. additionally the expansion and newly emerging industries like motor vehicle assembly, spare parts supplier, agricultural equipment and the expansion of requires huge amount of iron ore and other basic minerals. However, in the sector the rising costs of manufacturing, the shrinking metal resources of manufacturing bases, shortened product life cycles, the leveling of the playing field within manufacturing, and the globalization of market economies, with the growth of the world economy, the expenditure of steel has been growing dramatically Xiong & Hello (2008), Addis Ababa chamber of Commerce and Sectoral Association (AACCSA), (2015). In today's markets is led by advances in industrial technology, increased globalization of demand and supply sources, tremendous improvements in information availability, plentiful venture capital, and creative business designs (Mentzer, 2006). Presently with the developments of information and communication technology (ICT) and Era of globalization, supply chain is now accepted as the normal way of doing business Johnso (2006), Devaraj.et.al (2007). However Competition is no longer among firms, but among supply chains (Hult,2007).The enhancement of competitive performance of closely integrating the internal cross-functions within a company and effectively linking them with the external operations of suppliers and customers to be successful for Supply chain firms Silva *et.al* (2102), Otchere *et.al* (2013). According to Boon-itt (2011), elaborates that effective and efficient supply chain management requires integrated business processes that go beyond purchasing and logistics activities. The previous research work on supply chain integrations shows the significance role for manufacturing industries to improve their efficiency and firm performance for highly integrated Supply chains for quality and Competitive advantage Fabbe-Costes.*et.al* (2008), Wang (2010), Alfalla-Luque.*et.al* (2013). Otchere.*et.al*(2013). Formerly,

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Manufacturing industries (like Agro processing, lather and Textile industries) in developing countries are trying to access the different markets segment of the world starting from their local market to the complex and dynamic international market through limited supply chain Georgise, (2011).

The strategic supply chain integrating with suppliers to customer implies to improved operations and overall performances of the firms Kim (2009), Flynn.*et.al*(2009). Meanwhile, the basic metal industries of developing countries doesn't get enough attention and are not studied well and seems to be isolated from global literature Georgise,(2014).Nevertheless, Sutton & Kellow (2010), Thoben & Georgise, (2012), Msimangira, (2014) also indicate that there are many global supply chain problems, from the overseas suppliers to the local companies of developing nation industries in the domestic market. These problems are related to the use of outdated technology in the domestic market, lack of trust, documentation problems, specification requirements problems for products, procurement, product quantity, standardization, price set up, information systems, delivery lead time to compete in the global market. Even though developing country Basic metal industry have fragmental implement supply chain systems, without integrated supply chain, the success and survival of industries are less. hence we are intended to implement supply chain integrations on this basic metal industries on developing countries. However, In this paper to summarize the previous work about supply chain integration and identify the role of supply chain integration for developing nation Basic metal industries to contribute and develop the new way for integrating basic metal industries into supply chain as further investigation of the research .we are expect to show the effect, role of supply chain integration on Basic metal industry and what extant industries integrate into supply chain for comparative advantage.

#### a) *Objective*

The objective of this research is to investigate the, effect, system and role of supply chain integration on basic manufacturing industries and Identify the main constraints /gap SCI on developing nation metal to develop further investigations.

#### b) *Why supply chain (SC)?*

The establishment of supply chain was begins 1980s to improve the business efficiency and effectiveness for competitive manner from end user to suppliers. Supply Chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer Georgise (2011). Supply chain also describes as to the flow of materials, information, payments, and services from raw materials suppliers, through factories and warehouses, to the end customers. According to, Bhattacharya et al (2014) states that network of

organizations involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services to customer satisfactions through supply chain. The performance of the supply chain is measured by how companies are able to match supply to demand whilst driving down costs and simultaneously improving customer satisfaction and it is a critical tool to improve the various aspects organizations/firms.

Supply chain Scholars shows the importance of Supply Chain practice to firms' their competitive strategies and advantage as well as can improve organization performance Lambert and Cooper (2000), Birhanu (2014), Pathak (2015) Rao(2015). This idea supports the other scholars like Beamon (1998, Georgise (2011). Flynn.*et.al*(2009)also elaborates the direct effect of internal integration on business and operation performance, Customer integration operation performance and the collaborative effect of Supplier and customer integration on operational performance of the manufacturers. This implies that supply chain integration affect the performance of the organizations(Supply chain Firms). Companies began to reengineer ,old technology using information technology to improve the competitiveness of the sector. This led to emerge Supply chain integration. A supply chain consists of all stages involved, either directly or indirectly, in fulfilling a customer request. A supply chain includes manufacturer, supplier, transporters, warehouses, retailer, third-party logistics provider, and customer Awad & Nassar (2010). According to Georgise (2011) study, one of the most significant paradigm shifts of modern business management is that individual businesses no longer compete as solely autonomous entities, but rather as supply chains. Getting the right product, at the right price, at the right time to the consumer is not only the key success factor competitive success but also the key to survival. in the same fashion, many researchers and practitioners have studied Ethiopian SC issues related to Agro processing, lather and Textile industries Georgise & Thoben (2013), Pathak (2015). But the previous studies in metal industry sector mainly focused on, infrastructure and master planning, improving efficiency and Effectiveness of Individual industries. However, little attention has been paid by researchers to study SC issues in the metal industry sector. However Ethiopian Basic Metal Industries (EBMI) have fragmental Supply chain systems. According to Sutton and Kellow (2010) shows that, Ethiopian Flat steel product manufacturers import their input, cold-rolled sheet in coil (except for one firm which imports hot-rolled sheet, i.e. one step back). The long product manufacturers typically source their input from billets and scrap. Billets are imported from the international market through local agents and competitive bidding procedures. Scrap is mainly sourced from government organizations such as the

Ministry of Defense. Other sources include scrap collectors who gather from individual collectors (known as kuraleows). Formerly (Addis Ababa chamber of Commerce and Sectoral Association (AACCSA), 2015) indicate Metal and engineering industries is expected to raise the export earnings performance of the country in the near future. most production outputs from this subsector are primarily supplied to the domestic market, Despite its current export performance is inadequate, in the subsector the existing ones are not adequate and effective supply chains. Scholars Georgise.*et.al* (2011) shows that the problems are occurs due to Lack of advices technology and problems well organize information system regarding creating a business network among producer and consumers in and outside the country. But Scholars Melkas (2010), Aggarwal (2014), Amue (2014), Argue that, Information technology allows a prerequisite for the effective control of today's complex supply chains, so as to coordinate production with demand, slash inventory and cycle times, better manage logistics, improve customer satisfaction, and reduce overall costs. Dong (2009) describes, success of supply chain integration is largely conditioned by the extent of use of information technology and, enhance quality supply chain between organizations. Through the supply chain by ordering and responding of their needs, manufacturing industries improve the quality and timing of information flow to enhanced business environments Devaraj. *et. Al* (2007), Alfalla-Luqu.*et.al* (2013). Even though, basic metal industries have inadequate supply chains, it lacks this benefit, Hence we are intended to study supply chain integration of developing nation Basic metal industry, so as to integrate in global supply chains.

### c) Why Supply chain integration (SCI)?

It is a close alignment and coordination within a supply chain. Supply chain integration means the co-operation between various functions in the supply chain. The degree to which an organization strategically collaborates with its partners and manages intra- and inter-organizational processes in order to achieve efficient and effective flows of products, services, information, money and decisions Halme(2010).An effective and efficient supply chain integration achieves the well defined flows of products and services, information, money and decisions, to provide maximum value to the customer at low cost and high speed Flynn.*et.al*(2009).Integration can be characterized by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes Power (2005, Krishnapriya (2014). Supply chain member organizations integrate in to three dimensions customer, supplier and internal integration. This dimensions are considered as independent variables of supply chain

integrations on manufacturing industries Flynn.*et.al*(2009), Otchere.*et.al*(2013). Furthermore, Study describes as, Successful coordination and integration of supply chains for all the activities associated with moving goods from the raw materials stage through to the end user for sustainable competitive advantage Lambert and Cooper (2000).World-class organizations now realize that non-integrated manufacturing processes, non-integrated distribution processes and poor relationships with suppliers and customers are inadequate for their success. the success coordination, integration management of key business across the member of supply chain will determine the ultimate success of the single industry Vorst (2000). Researchers like Alfalla-Luqu *et.al* (2013) literature review analyses shows how supply chain integration affects the overall supply chain (SC) performance in terms of efficiency and responsiveness. In most modern systems, the wisdom is it's better to do what you do best and own a very limited asset. Nearly everything is outsourced but the brand and distribution process integration with supply chain partners Ray (2013). However, in the developing Country manufacturing industry, supply integration still infant. According to Getahun (2012) Investigates that, lack of supply integration and customer integration within the garment industry, Have the potential to affect the quality and competitive advantage of the sector.

Negussie (2014) supply chain Evaluation study shows that leather are suffering from the shortage of raw material (hides and skins) as well as its quality problem. Companies in developing countries need to integrate their operations, especially the sourcing processes into the global supply chain Georgise (2014),Msimangira (2014) and some sectors are Fragmental and infant integration(like basic metal) industries Xiong & Helo (2008). Hence it is an important issue, to implement supply chain strategy. while, supply chain integration focuses on two key issues--alignment and linkage--both *inside* an organization and *across* organizations. However, we intended to implement integrated supply chains systems for Basic Metal industries, order to bring the improvement within basic metal industry, the problems associated with resource, information, skill man power, market place will be address. although creating better integration and communication through the supply chain will implement. Integrating supply chain, helps between this integrated metal industries, Aligned to accomplish common vision, goals, purpose and objectives across organizations, functions and processes in the supply chain. they ensures that there is consistency in the direction and objectives as these plans and decisions are made Maqsood(2002, Malik Khalfan(2004). Scholars argue that, currently metal resource reduce time to time, this reduce the performance and capacity of metal industries, main while to overcame the problems, BMI should link trough

supply chain. Linkage provides Communication and sharing of information needed for planning and decision-making, and the interaction of people involved in planning and decision-making, Sharing problems and working together to find solutions Malik Khalfan (2004). Linkage ensures that the information necessary for decision-making is available, and that different functions and entities in the supply chain are working with the same data as decisions are made. Hence we select as a Key, How, when and what Extent to link and Align, this Basic metal industry through Supply Chain as way of to improve the effectiveness and performance of an organization.

## II. DESIGN/METHODOLOGY/APPROACH

To achieve the objectives a Systematic literature reviews is carried out to the previous research work in the SCI research area, discusses, evaluate their role and contributions, identify the main concept and summaries knowledge, thereby identifying their gap, implications and potential directions of further research.

### *Selection of the Journals*

In order to achieve the objective, we use online databases and library services such as Taylor & Francis ([www.tandfonline.com](http://www.tandfonline.com)), Emerald ([www.emeraldinsight.com](http://www.emeraldinsight.com)), ELSEVIER ([www.elsevier.com](http://www.elsevier.com)), [www.sciencedirect.com](http://www.sciencedirect.com) and other related international journals allied to our work. The selection of the data base and journals for the study is follow and guided by data base and journal rankings and citation index, Date of Publication, Name of Author( affiliation), for Google scholar browse we also Title of Journal(Is this a scholarly or a popular journal). A search of articles published between 2000 and 2016 identify with the words Supply chain: integration: Global Supply chain: Basic metal: Supply chain leadership and logistics in the title, keywords, we used. From total of 58 articles 21 articles are selected and use for the analysis.

### a) *Literature review*

In this section go through **21 selected** articles which are related to Supply chain and Supply chain integrations are presented in the table, then discuss the main concepts of the article and identify the gap and future work is proposed.

Author	Title	Objectives	Research type	Research Method and Materials	Findings	Journal
1. Alfalla-Luqu. et.a/(2013)	Supply chain integration framework kusing literature review	-Identify dimension and variable of Supply chain integration	literature review	critical review of the literature	- illustrated SCI is analyzed in terms of as multi-dimensional framework (information integration, Coordination resource sharing and organizational relationship linkage ) into consideration and these are analyzed from both the inter- and intra-organizational perspectives. In addition found out variables of SCI is not only considered a process and technique, it also has important human and organizational behavior components. SCI needs to be included in the organizational Culture because SCI supported by human interactions. Also shows pints, before external integration firms should be integrated internally and then develop external integrations. -show performance improved by implementing supply chain integrations between Firms.	Taylor & Francis /journal of Production Planning & Control
2. Xiong & Helo(2008)	Challenges to the supply chain in the steel industry	paper investigates the key factors within the supply chain that supports steel production	Research	Survey	-Relationship; Engineering and information technology is identified as the factors that influence steel SC. The result shows the benefit of relocation and consolidation of SC b/n steel industries. They indicated as complex steel industry SC improve trough business relationship; engineering and Visible information sharing, so as to the success of steel industry cooperation: distribution: shearing and exchange b/n( supplier ,distributor and end-user ) and develop win-win -situations	International Journal of Logistics Economics and Globalization 2008
3. Msimangi & Teshah(2014)	Global Supply Chain Practices and Problems Facing Developing Countries: A Study in Tanzania	To explore global supply chain problems and risk facing on developing nation.	Case study	qualitative data collection method used -Apply cross-case analysis to analyze the data	-Key problems for SC investigated from the study are the use of outdated technology in the domestic market, lack of trust, documentation problems, quality assurance, procurement of counterfeit products, quantity demanded, price set up, information system, ,problems skill managers, lack of cooperation b/n SC firms. The result also shows that the problems are occurred due to overseas suppliers to the local public transport companies (buyers or customers) has not been working effectively and efficiently (in the local part of the global supply chain) to meet the requirements of the customers,	Operations And Supply Chain Management (2014)
4. Otch	Assessing the Challenges	Examined the major challenges	Survey	Study adopted an additive	-identify, three stages of SCI , Functional, internal and external integrations, also found in three levels ; low integration, medium (partial) integration, and full	International Journal

ere.et. a/(201 3	es and Implemen tation of Supply Chain Integratio n in the Cocoa Industry	within the industry, which inhibits effective implementatio n and use of supply chain integration		(inductive and deductive) approach, the focus leaned more towards deductive and Interview administere d questionnai re and self- administere d questionnai re were used to collect quantitative data.	(complete) integration are observed, the power of integration to leads to improved performance and competitive advantage on SC firms. They proposed that implementing complete integration both upstream (Supplier Integration), operations (Internal Integration), and downstream (Customer Integration) is better than concentrating on only one aspect. - Also find out the factors faced in the industries were include problems database and information inefficient resources ,Problems in JIT , these leads /challenges performance, and product.	of Busines s and Social Science, 2013
5.Flyn n.et.a/( 2009)	The impact of supply chain integratio n on performa nce: A contingen cy and configurat ion approach	study and determined the impact of individual SCI dimensions (customer, supplier and internal integration) and their interactions on performance.	applying the contingen cy approach	Survey	-Found that internal integration SCI was direct effect on both business and operational performance and that customer integration was directly related to operational performance. Although supplier integration was not directly related to either type of performance, but the interaction of supplier and customer integration was related to operational performance. They summarize that, while internal integration was positively related to business performance, supplier and customer integration were not directly related to business performance. This may be because customer and supplier integration are related to business performance through operational performance. internal integration forms the foundation upon which customer and supplier integration build.	Journal of Operatio ns Manage ment
6.Zha o.et.a/( 2008)	The impact of power and relatio nship commitm ent on the integratio n between manufac turers and customer s in a supply chain	Investigate the relationship between power, relationship commitment and the integration of manufacturers with their customers,	Survey	They use power- relationship commitmen t theory	-Results show that appropriate use of power can significantly enhance relationship commitment. Improvement in relationship commitment, especially normative relationship commitment, while reducing transaction costs and opportunistic behaviors. They also found that reward power had a positive impact on both normative(culture) and instrumental relationship commitment in China.	Journal of Operatio ns Manage ment

7. Mos hkdani an& Molah ossein i(2013)	Impact of supply chain integration on the performance of Bahman group(Automotive Industry)	Examine the relationships of long-term relationships, information integration, logistic integration and find out impact on operational performance.	survey	Survey	-They dig out the as information sharing and information technology are a key argument in success of logistic integration of automotive industries to improve their performance. Further, show that long-term relationships with suppliers will improve performance but Long-term relationships indirectly and through information technology and information sharing, and then logistics integration are effective for operational performance.	Interdisciplinary Journal of Contemporary Research In Business
8Agus (2011)	The Structural Influence of Supply Chain Management on Product Quality and Business Performance	The study determine critical variables of SCM and assess the importance of each SCM dimension on performance. significant influence on product quality.	Research	The instrument used in this study was a structured survey questionnaire, and analyzed using SPSS.	-Find that Product conformance, product reliability and. -The findings suggested that to enhance product quality, a manufacturing company should invest its resources in incorporating lean production and technology and innovation in SCM to ensure that production runs effectively and efficiently resulting in high quality products. The result shows, ultimately overall business performance improved trough manufacturing company investment in new technology and innovation in SCM and adoption of lean production would be able to improve 'return on sales', 'return on assets', market share. Study suggest that SCM enhances product quality and has a positive effect on business performance.	International Journal of Trade, Economics and Finance
9 Boon-itt(2011)	Achieving Product Quality Performance: The Roles of Supply Chain Integration and Information Technology	To discover whether or not product quality requires different types of information technology in implementing supply chain integration.	Research paper	Survey	-They found that internal integration highly a significant effect on product quality performance. Further, product quality performance is not influenced by the interaction effect between supply chain integration and information technology in terms of communication/information flow. Rather, interaction effect of collaboration/decision support information technology to enhance the effectiveness of supply and customer integration.	International Journal of Innovation Management and Technology
10.Lotfi.et.al/(2013)	A Product Quality - Supply Chain Integration Framework	Investigated the relationship between dimensions of product quality and supply chain integration.	Research	Adopted both a qualitative and a quantitative approach	-Effective supply chain integration and collaborative activities between manufacturer, supplier and customer which enables firms to work together and improve product quality. Three dimensions for supply chain integration are customer integration, supplier integration, and internal integration, whereas design quality and conformance quality as quality dimensions.	Integration Framework Journal of Applied Sciences,
11.Lotfi.et.al/(2013)	The Relationships between Supply Chain Integration and Product Quality	examine the effect of seamless supply chain on the product quality	Research	literature review	From the study indicated that internal integration has effects on supplier integration as well as customer integration. On the other hand design quality has effects on conformance quality and also each dimension of supply chain integration affects each dimension of product quality. -Theoretical and literature review evidences that internal and external integration have impacts on design quality and conformance quality leading to improvements of competitive capabilities in firms. they	International Conference on Electrical Engineering and Informatics



					advise that ,firms pay more attention to supplier integration and customer integration then to predict that their product quality capability to enhanced.	
12. Maleki & Cruz-Machado(2010)	An Empirical Review On Supply Chain Integration	The result was review discussed and criticizes the current state of literature on SCI.	literature review	literature review	The result directed, SCI driving forces of industry sectors; positioning in the chain; lack of reports in fail stories; focuses of SCI literature on vertical integration and performance measures and missing other aspects.	Management and Production Engineering Review
13. Ozdemir and Aslan(2011)	Supply Chain Integration, Competition Capability and Business Performance	The effect of supply chain integration on the companies' competitive capabilities and performance was examined.	Case study in Turkey.	surveys	The result found that the supply chain integration affects the companies competitive capabilities and performance positively. Also supply chain integration and subtitles of the competitive capabilities (cost leadership, customer service, flexibility and product indicators) are found to be significant. mean time found that competitive capabilities affect market performance and financial performance in a positive way, no significant effect on customer satisfaction is found. Supply chain integration has very little effect on business performance; affects only market performance positively.	Asian Journal of Business Management.
14. Zolait. et.al(2010)	Supply Chain integration	Examines the relationship between supply chain process integration and firm performance	Survey	Quantitative method, sampling and self-administered survey questionnaires were use.	Found the impact of dimensions of supply chain process integration were significant to firm performance. The study highlighted the achievement of supply chain strategy through upstream and downstream integration as part of the manufacturing strategy. In addition, several significant contributions in terms of managerial implications are also purported. First, managers in manufacturing firms whom are not to totally involved in the initiative of supply chain process integration should start aggressively managing supply chain process integration. Second, manufacturers who are already following this approach but at a slow pace of execution should move rapidly to enhance information flow integration followed by physical flow and financial flow integration across supply chain. Moreover, information flow integration shows a greater influence than physical and financial flow integration, and considered as the most dominant factor to influence the firm performance.	Journal of Systems and Information Technology
15. Georise. et.al(2014)	Integrating Developing Country Manufacturing Industries into Global Supply Chain	examined the level of inter organizational and intra-organizational supply chain integration practices in developing country, Ethiopia.	survey	questionnaire survey is used to collect the current practices of Descriptive statistics is primarily used for the analysis	-Results show a low level of supply chain relationship both in intra and inter organizational supply chain integration have inefficient supply chain integration. Their result indicates ,companies seem to be oriented towards integration inside the organization but their result shows, degree of integration is low. There is also problems on information shearing, instead of using integrated information systems(internet), still use old communication systems(mainly telephone, mobile, letters, telex, and faxes ) were applied.	Journal of Industrial Engineering and Management.

16Georgise.e t.a/(2014)	Supply Chain Integration in the Manufacturing Firms in Developing Country	Analyzed supply chain integration practices and the challenges faced in the manufacturing firms in developing countries.	Case Study	Literature survey and primary data semi structured interviews they used	-Identified supply chain integration is fragmental and limited on functional base boundaries within the firm. Also show, the problem of supply chain members(Firms) and allocation of functions among the members. the company has faced higher challenges in their raw material, lack of integration between ( companies, departments, functions), information exchange and planning activities to fulfill the appropriate delivery lead time, problems in quality and standardization in operational processes were investigated.	Hindawi Publishing Corporation, Journal of Industrial Engineering
17 Jozi & Moradi(2014)	The Impact of Supply Chain Integration on Customer Satisfaction and Financial Performance	Investigated effects of supply chain integration on customers' satisfaction and financial performance	Case study	They used quantitative, descriptive and correlative methodology, and instrument study a questionnaire were apply.	-Study showed, a positive relationship among internal integration with suppliers integration and customers integration is, customers' integration has positive influence on customer satisfaction, and customers' satisfaction has a positive influence on the financial Performance. -They elaborate that, coordinates activities in a way that customers would be able to obtain the products with high quality and at a minimum cost.	International Journal of Review in Life Sciences
18. Agan(2011)	Impact of Operations, Marketing, and Information Technology Capabilities on Supply Chain Integration	Identify Impact of Operations, Marketing, and Information Technology Capabilities on Supply Chain Integration.	Research	Used... Survey method and is Multi- scale measurements is employed.	-In the study they find out the following results, partner selection and collaboration are positively impacting integration, while learning is not significant and operations human resources can be conceived to be negatively correlated with supply chain integration. Information technology infrastructure is significantly impacting integration as well as performance directly. Market orientation also have both direct effects on financial performance and indirect effects through supply chain integration.	Journal of Economic and Social Research
19.SofyaliođluOztürk(2012)	Meta Analysis of the Relationship between Supply Chain Integration Dimensions and Firm Performance	Investigated Supply Chain Integration Dimensions and Firm Performance Relationship.	Research	Meta Analysis	-SCI is handled under the four dimensions in our study; internal integration, supplier integration, customer integration and information integration respectively. Study found that most of the SCI sub-dimensions does not directly relates to operational and business performance, it reveals two exceptional situations. They are also found the relationships between customer integration and operational performance, and between internal integration and business performance. Further investigated customer integration positively influences operational performance and internal integration positively influences business performance.	European Journal of Economics, Finance and Administrative Sciences

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20Baharanci(2011)	Investigating Relationship between Product Features and Supply Chain Integration	-Examined the relationships between supply chain integrations( internal, upstream (supply)and downstream (demand) ) and with product features(innovative and quality)	Research	survey method	-This result provides that highly collaborative practices with suppliers and customers are likely to have an excellence performance in product quality and innovation due to the improvement of information visibility in supply chain. Firms targeting in high product quality performance require a greater need for supply integration than customer integration. -Also obtained that, firms that focus on product innovation need more focus on customer integration than supply integration.	International Journal of Mechanical Aerospace, Industrial, mechatronics, and Manufacturing Engineering.
21. Deshpande(2012)	Supply Chain Management Dimensions, Supply Chain Performance and Organizational Performance	To Analyzed the SCM performance measures and how SCM dimension related to organizational performance .	Research	Comprehensive literature review, a theoretical framework and propositions were derive.	-Result show that increased interaction between important constituents of supply chain management, enhance the organization's ability to meet desired goals. Improved organizational performance, measurements like Cost savings, increased revenues, and the reduction of defects in products were obtained by the implementation of supply chain managements. -The result also indicated that, the integrated framework provides managers with a overarching framework for linkages between SCM dimensions, SCM performance, and organization performance.	

### III. DISCUSSION

Wide range of research work was conducted to related with supply chain and supply chain integrations. We apply Systematic review analysis to summarized the concepts in the table above and it give lights on to different aspects of supply chain integrations of manufacturing industries. The analysis of the paper are trussed and researchers conducted about the level and dimension of supply chain integration, the extent of firm integration, affect comparative advantages was truss. Other papers give direction for the effect of supply chain integration on product quality, firm performance, market shear, efficiency, capability and competitiveness of the company. furthermore they also show the effect of information shearing, resource, knowledge, culture on supply chain integrations. Therefore from the analysis we find the following points.

#### a) The key factors influence on supply chain integration

There are numerous factor influence the implementation of supply chain integration, this factor have appositive or negative impact on firm performance, market shearing and competitiveness. Vaar & Donk (2008), Otchere *et.al* (2013), Msimangira & Tesha (2014) Technology, skill, information shearing, collaboration, decision making, Trust, the extent of integration or level

of integration, are the common problems indentified from the study. according to Moshkdanian & Molahosseini (2013) Information sharing between Manufacturer and its suppliers has a positive relationship with its logistics integration. integration of material flow needs to be information shearing and integration between supply chain companies for competitive performance. Furthermore market share and in particular business performance on manufacturing company improved trough investing in new technology and adopting of innovative supply chain integrations Agus (2011). this result shows that instead of using outdate technology it is better to use new technology and systems to improve the overall performance of Supply chain integrations on integrated and member organizations. weak and improper supply chain integration also major factor on supply chain integrations.

Flynn *et.al* (2009), Agus (2011, Lotfi *et.al* (2013) argue, that Supply chain partners cooperation and collaboration improve manufacturing companies in terms of quality, performance and market shearing. Effective supply chain integration and collaborative activities between manufacturer, supplier and costumer which enables firms to work together and improve product quality. They believe that the integration is found as customer integration, supplier integration, and

internal integration. The study indicated that internal integration has effects on supplier integration as well as customer integration. we argue that the interaction, collaboration and level of supply chain integration affects the companies competitive capabilities and their performance. However, Adopting proper information shearing, Manufacturing industries should implement highly integrated supply systems in three levels that is, customer, supplier and internal integrations so as to improve product conformance, manufacturing capacity, product quality, market shearing and their performances as well.

#### b) *The Role of Information on Supply Chain Integration*

In this study we find out the role of information shearing and information technology for the collaboration, communication and coordination of Supply chain industry, enhance the effectiveness of supply and customer integration. Boon-itt (2011), Moshkdanian & Molahosseini (2013) bring to light that, information sharing and information technology are a key argument in success integration of automotive industries to improve their performance. Researchers also argue that, information technology infrastructure is significantly impacting supply chain integration as well as firm performance directly Agan (2011). According to Alfalla-Luqu.*et.al* (2013) Supply chain integration was analyze in terms of as multi-dimensional framework on information integration, Coordination resource sharing and organizational relationship linkage from both the inter- and intra-organizational perspectives.

#### c) *The effect of supply chain integration on Quality*

Supply chain integration and quality are the two success factor of an organizations. An integrated supply chain improve quality and customer satisfaction. From the previous study we observed that Lotfi.*et.al*(2013), the higher integration of internal and external supply chain have impacts on design quality and conformance quality. these quality affects the overall performance of the organizations. They also Argue, collaborative activities between manufacturer, supplier and costumer which enables firms to work together and improve product quality. The interaction effect of collaboration/decision support information technology to enhance the effectiveness of supply and prevent quality problems Boon-itt(2011).This implies that within integrated information shearing and collaboration, integrated supply chain have critical role for enhancing quality and comparative advantages. other study provides that, highly collaborative practices with suppliers and customers are likely to have an excellence performance in product quality and innovation due to the improvement of information visibility in supply chain Baharanchi (2011). Hence high supply chain integration results, excellence performance in product quality.

#### d) *The effect of supply chain integration on performance*

The performance of manufacturing industry highly interrelated with the way and the extent of supply chain integrated. This Supply chain integration is considered as a critical effect in improving firm performance. Ozdemir and Aslan (2011) found that the supply chain integration affects the companies competitive capabilities and performance of firms. He elaborates, supply chain integration and subtitles of the competitive capabilities (cost leadership, customer service, flexibility and product indicators), affect market and financial performance of supply chains. study on Agan (2011) show that, Supply chain integration likely improve performance by eliminating inefficiencies and inconsistencies, streamlining processes, providing customers what they want, when they want it, reducing excess inventories, and proactively managing demand. However valuable integration of suppliers into supply chain will be a key factor for some manufacturers in achieving competitive advantage and performance. These also supported by Vickery.*et.al* (2003), Agus (2011), Moshkdanian & Molahosseini (2013) findings of Product conformance, product reliability and product durability had high correlations with all SCM dimensions especially with 'lean production', and 'new technology and innovation. The analysis also supported Vaart& Donk(2007), Krishnapriya & Baral (2014). The result shows, ultimately overall business performance improved trough manufacturing company investment in new technology and innovation in supply chain integration and adoption of lean production Systems in Manufacturing companies. These shows implies that developing an integrated supply chain system ultimately improve the performance of manufacturing industries.

From the analysis and finding, we summarize, most of the selected articles are discussed about how variables, key factors of supply chain integration like Technology, information shearing and information technology, Collaboration, cooperation and integration, way and level of supply chain integration and belief affect the overall capacity and performance of the supply chain integration. On the other hand, effective and efficient resource utilization, information shearing, supply chain coordination and cooperation, highly bonded supply chain integration, adopting appropriate technology, fully supply chain system(Internal, customer & supplier), are improve quality, trust, market shear and the overall performance of the Supply chain Industries Zolait *et al*(2010), Agan (2011), Baharanchi (2011), Deshpande (2012), Jozi & Moradi(2014).

Most of the research is concerned on supply chain performance, supply chain cooperation and information shearing, type of integration(internal, external), the effect of supply chain integration on firm

performance and quality Xiong & Helo (2008), Otchere.*et.al*(2013, Msimangira & Tesha(2014). In Basic metal industry Supply chain integration found and it should be a complex and compressive issue between the supply chain organizations. These implies that supply chain integration involves, Innovation and technology transfer, Social and Environmental responsibility, Supply chain leadership (Leader), on industrial safety and Occupational health, Environmental sustainable performance, political issue will into consideration and need further researches. Few researches Flynn. *et. Al* (2009) also conducted to effects of supply chain integration on performance and quality seen from manufacturers point of view but missing for supply chain integration effect on firm performance from customer and supplier concepts. Because supply chain integration is interaction and effect of multi-dimensional joints(Manufacturer, Supplier, Customer) systems and hence justify the exact performance, needs for further investigations.

#### IV. CONCLUSION

In this study, supply chain integration of basic metal industry is addressed. During of globalization and advancement of information technology basic metal industries work together, to improve their performance and competitiveness on global markets. Meanwhile, in this work the key factors of supply chain integration and the effects of supply chain integration on basic metal industries are clearly discussed. In main time further research areas also proposed. The limitation of this work is, most information's gather from secondary data not considered primary data (questioners are not distributed to the industries.

#### REFERENCES RÉFÉRENCES REFERENCIAS

- Rafaela Alfalla-Luque, Carmen Medina-Lopez & Prasanta Kumar Dey (2013) Supply chain integration framework using literature review, *Production Planning & Control: The Management of Operations*, 24:8-9, 800-817, DOI:10.1080/09537287.2012.666870
- Guangyu Xiong & Petri Helo(2008) Challenges to the supply chain in the steel industry *International Journal of Logistics Economics and Globalisation* · February 2008 DOI: 10.1504/IJLEG.2008.020529 ·
- Kabossa A.B. Msimangira, & Clemence P. Tesha (2104) *Global Supply Chain Practices and Problems Facing Developing Countries: A Study in Tanzania, Operations And Supply Chain Management* Vol. 7, No. 3, 2014, pp. 130 - 138 ISSN 1979-3561 | EISSN 1979-3871.
- Alexander Fianko Otchere, Jonathan Annan, Emmanuel Quansah (2013) *Assessing the Challenges and Implementation of Supply Chain Integration in the Cocoa Industry: a factor of Cocoa Farmers in Ashanti Region of Ghana, International Journal of Business and Social Science* Vol. 4 No. 5; May 201.
- Barbara B. Flynn <sup>a</sup>, Baofeng Huo <sup>b,c,\*</sup>,<sup>1</sup>, Xiande Zhao <sup>d</sup>,<sup>2</sup>,(2010), The impact of supply chain integration on performance: A contingency and configuration approach, *Journal of Operations Management/ journal homepage: www.elsevier.com/locate/jom*
- Hussain A.H Awad, Mohammad Othman Nassar (2010), *Supply Chain Integration:Definition and Challenges*,
- Xiande Zhao <sup>a,\*</sup>, Baofeng Huo <sup>b,1</sup>, Barbara B. Flynn <sup>c,2</sup>, Jeff Hoi Yan Yeung <sup>a,3</sup>. (2008)The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain, *Journal of Operations Management* 26 (2008) 368–388, Science Direct/ www.elsevier.com/locate/jom
- Fateme Moshkdanian & Dr. Ali Molahosseini (2013)Impact of supply chain integration on the performance of Bahman group, *ijcrb.webs.com INTERDISCIPLINARY JOURNAL OF Contemporary Research In Business* Copy Right © 2013 Institute of Interdisciplinary Business Research 1 8 4 May 2013 Vol 5, No 1
- Arawati Agus,2011, The Structural Influence of Supply Chain Management on Product Quality and Business Performance, *International Journal of Trade, Economics and Finance*, Vol. 2, No. 4, August 2011
- Sakun Boon-itt(2011), Achieving Product Quality Performance: The Roles of Supply Chain Integration and Information Technology, *International Journal of Innovation Management and Technology*, Vol. 2, No. 5, October 201.
- LOTFI, Z., SAHRAN, S. & MUKHTAR, M. 2013. A Product Quality - Supply Chain Integration Framework *Journal of Applied Sciences*, 13, 36-48. doi: 10.3923/jas.2013.36.48
- Zahra Lotfi\*, Shahnorbanun Sahran, Muriati Mukhtar, Ali Taei Zadeh(2013) The Relationships between Supply Chain Integration and Product Quality The 4th International Conference on Electrical Engineering and Informatics (ICEEI 2013) *Procedia Technology* 11 ( 2013 ) 471 – 478, Available online at www.sciencedirect.com
- MeySam Maleki, Virgilio Cruz-Machado (2013) An Empirical Review On Supply Chain Integration, *Management and Production Engineering Review* Volume 4 • Number 1 • March 2013 • pp. 85–96 DOI: 10.2478/mper-2013-0010
- Fasika Bete Georgise1, Thoben Klaus-Dieter2, Marcus Seifert2(2014), *Integrating Developing Country Manufacturing Industries into Global Supply*

- Chain Journal of Industrial Engineering and Management JIEM, 2014 – 7(1): 174-193 – Online ISSN: 2014-0953 – Print ISSN: 2014-8423 <http://dx.doi.org/10.3926/jiem.845>
15. <sup>1</sup>A.Ö. Özdemir and <sup>2</sup>E. Aslan,(2011) Supply Chain Integration, Competition Capability and Business Performance: A Study on Turkish SMEs, Asian Journal of Business Management 3(4): 325-332, 2011, ISSN: 2041-8752.
  16. Souresh Bhattacharya<sup>1</sup>, Dr. D. Mukhopadhyay<sup>2</sup> and Dr. Sunil Giri<sup>3</sup> (2014) Supply Chain Management In Indian Automotive Industry : Complexities, Challenges And Way Ahead, International Journal of Managing Value and Supply Chains (IJMVSC) Vol.5, No. 2, June 2014
  17. Ali Hussein Zolait and Abdul Razak Ibrahim (2010) Supply chain integration: an empirical study on manufacturing industry in Malaysia, Journal of Systems and Information Technology Vol. 12 No. 3, 2010 pp. 210-221@Emerald Group Publishing Limited,1328-7265 DOI 10.1108/13287261011070830
  18. Meiling He<sup>a\*</sup>, Junping Xie<sup>a</sup>, Xiaohui Wu<sup>a</sup> , Qifan Hub, Yu Dai<sup>a</sup>,(2016) Capability Coordination in Automobile Logistics Service Supply Chain Based on Reliability, Procedia Engineering 137 ( 2016 ) 325 – 333, doi: 10.1016/j.proeng.2016.01.265
  19. Narges Jozi<sup>1</sup>, Ali Reza Moradi<sup>2\*</sup> (2014) The Impact of Supply Chain Integration on Customers' Satisfaction and Financial Performance (Case Study Office of Corn Khorramabad Town), Jozi *et al.*, Int. J. Rev. Life. Sci., 4(12), 2014, 210-217, ISSN 2231-2935
  20. Peter W. Stonebraker Jianwen Liao, (2006),"Supply chain integration: exploring product and environmental contingencies", Supply Chain Management: An International Journal, Vol. 11 Iss 1 pp. 34 - 43 Permanent link to this document: <http://dx.doi.org/10.1108/13598540610642457>.
  21. Yavuz Agan (2011) Impact of Operations, Marketing, and Information Technology Capabilities on Supply Chain Integration, Journal of Economic and Social Research Vol 13(1) 2011, 27-58.
  22. Çiğdem Sofyaloğlu, Şule Öztürk, (2012) Meta Analysis of the Relationship between Supply Chain Integration Dimensions and Firm Performance, European Journal of Economics, Finance and Administrative Sciences ISSN 1450-2275 Issue 52 September, 2012@ EuroJournals, Inc. 2012 <http://www.eurojournals.com/EJEFAS.htm>.
  23. Saied Rasul Hosseini Baharanchi (2011) Investigating Relationship between Product Features and Supply Chain Integration, International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering Vol:5, No:9, 2011.
  24. Anant Deshpande (2012) Supply Chain Management Dimensions, Supply Chain Performance and Organizational Performance: An Integrated Framework, International Journal of Business and Management Vol. 7, No. 8; April 2012, doi:10.5539/ijbm.v7n8p2 URL: <http://dx.doi.org/10.5539/ijbm.v7n8p2>.
  25. Shawnee K. Vickery a, Jayanth Jayaram b, Cornelia Droge a, Roger Calantone a,(2003) The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships, Journal of Operations Management 21 (2003) 523–539, 0272-6963/\$ – see front matter © 2003 Published by Elsevier B.V. doi:10.1016/j.jom.2003.02.002

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