

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



Effectiveness of Supply Chain Integration: A Literature review on Small Firms.

Dr Ing Ronald Cuschieri and co-authors Dr Ing Alex Rizzo and Dr Ronald Aquilina



ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



The Research Agenda:

- The Context of SCI within SMEs in EU member states & Malta.
- Supply Chain Integration (SCI) and performance improvement: Bottlenecks and Value-Added operations.
- Research methodology and the key themes.
- Research paper objective: the systematic literature review; Propositions & conceptual framework.
- Literature review and hypothesis development
- SCI: The SCI Conceptual framework
- Thirteen (13) Proposed Hypothesis
- Conclusion & Recommended Future Research
- Research Limitations

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



The research context: The European Union's (EU) and the Supply Chain Integration (SCI) perspectives

- The European Union's (EU) objective to become **carbon neutral** by 2050 requires the joint effort of larger companies and small and medium sized enterprises (SMEs) in the supply chain.
- SMEs account for most of the job's creation opportunities and economic development (Dey et al., 2022) with around 90% of businesses and more than 50% of employment worldwide (World Bank Finance, 2021).
- For the EU, the average value that **SMEs contribute to the economy** is around 56 percent (Statista, 2021).
- It is advocated that Supply Chain Integration (SCI) is a strategic decision of a focal firm to **improve performance** (Munir et al. 2020; Phan et al., 2020; Tian, et al., 2021).
- The **SCI** is contributing to **today's business challenge** for delivering cutting edge products and services to satisfy the **emerging customers' need** and to **improve performance** (Munir et al. 2020; Phan et al., 2020; Tian, et al., 2021) through the acquisition, processing, storage, and generation of knowledge (Kim & Park, 2018; Tian, et al., 2021).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED
QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



Supply Chain Integration (SCI) and performance improvement: Bottlenecks and Value-Added operations

- **Technology deployment** (Coffie et al., 2020); **innovative commitments**; and **stakeholders' pressure** (Mensah, 2014; Zhu et al., 2013; Maas et al., 2017; Tian et al., 2021) are the three dimensions that are considered to contribute to the SC **performance improvement**.
- **SCI** consists of **value-creation** initiatives between all SC players (Ranjan & Read, 2016; ; Hein et al., 2019; Donbesuur et al., 2020; Mendoza-Silva, 2021; Tian, et al., 2021) and the provision of **shared-value** (Rajapathirana & Hui, 2018; Le & Lei, 2019; Shafi, 2020; Tian, et al., 2021).
- **SCI bottlenecks** with all SC players and/or stakeholders, may be attributed to communication failure, inadequate resources, organizational culture and structure, issues of trust, misalignment of strategic objectives, and unresolved conflicts within an organization (Fawcett et al., 2012; Tian, et al., 2021).
- Over the past decade, **various governments** with the **support of EU within Europe**, have instituted **reforms and commitments to increase the output of SMEs, to create a stress-free start-ups**; the diffusion of information technology; the provision of training and support; and financial assistance such as grants and schemes of investments to promote further investment and **to work together in synergy across the SC to improve the current local and international economies**.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED
QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



Research methodology and the key themes: servitization; innovation; triple bottom line (3BL); information systems (industry 4.0); value creation; quality management; and technology deployment

- The systematic literature review was based on a **one stop database search application** used for research purposes covering various databases such as EBSCO, ProQuest, Emerald, Scopus, ScienceDirect and Directory of open access Journals among others including the **google scholar** search engine
- The initial search filters were based on two keywords, namely **'supply chain integration' (SCI)** and **'small firm'** with the **'And'** operator.
- Several abstracts of latest academic peer review papers, mainly within the **last ten years**, were read to establish the relevance to the theme of SCI, without excluding any **seminal works** so as to situate the research on a solid platform, based on pivotal scholarly sources within the **SCI literature**.
- The selected papers were then analysed in further depth vis a vis their **introduction and conclusion** to ensure that such papers were relevant and **fit the research objectives**. This was followed with a more **rigorous analysis of the literature** within each paper to establish the **significance of each theme**.
- A more refined search was again performed on all databases for each **emerged theme** vis a vis **SCI** as the core theme within **small firms** as the **three keywords**, to derive the final business model based on such key themes **one by one** (i.e. three keywords: the 'emerged theme' such as 'innovation'; SCI; & small firms).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED
QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



Research paper objective: The Systematic Literature Review; Propositions & Conceptual Framework

- The **scope of the systematic literature review** was used to **synthesize and disseminate evidence** across various areas of research practices on the key relevant theory within **SCI in small firms** (Tranfield, Denyer & Smart et al., 2003; Saunders, Lewis & Thornhill, 2009).
- The **research paper objective** also includes a **set of propositions** based on the literature to be recommended for **future empirical research** and also a **conceptual framework** to act as a roadmap on **SCI to achieve effective and efficient performance** and to be tested for its **validity and relevance**.
- **Our presentation** is structured as follows: the **literature background; identification of the main supply chain themes that affect SCI** and their relationships between them; the set of **thirteen propositions**; the **conceptual framework** derived from the literature; the **conclusion** with the identified **literature gaps**, with the main insights against the extant literature and finally the **research limitations** and the directions for **future research**.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



Literature review: The Supply chain management (SCM) perspective

- **SCM** within manufacturing SMEs is a source of **competitive edge** (Ataseven and Nair, 2017; Lu et al., 2018; Kalyar, Shafique, & Ahmad, 2020; Han and Huo, 2020; Abdallah, Alhyari & Alfar, 2023) since players work together to produce improved **performance effectiveness and efficiencies** (Tsanos et al., 2014; Kalyar, Shafique & Ahmad, 2020).
- To explain the two key terms with an example, the **efficiency** dimension refers to the flexibility to respond to changes with no added operational costs and it includes all value adding activities in the process used, whilst **effectiveness** dimension refers to the achievement of the right performance in all orders from start to completion (Tsanos et al., 2014; Kalyar, Shafique, & Ahmad, 2020).
- The performance outcomes sum up to both **operational and business indicators** (Cuschieri, 2015; Skipworth, et al., 2015; Prakash et al., 2017; Mwita, 2019; Muafi, & Kusumawati, 2021).
- The SC is made up from various players in emerging and developed markets, where every SC actor may employ different **performance metrics** at firm level (De Haan and Sacristán-Díaz, 2016; Kalyar, Shafique, & Ahmad, 2020).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCM & SCI: Operations; outsourcing; performance; contextual conditions & the SC leader

- **SCI** is needed so that all players try to synchronise their performance measures to work together so as to promote **streamlined operations**.
- The scope of the SC is to outsource some operations, so that **any player** may focus on its **core competencies**, referred to as the **make or buy strategic decision**.
- When **outsourcing** is implemented (i.e. buy decision), a player within the SC will benefit from various **advantages** such as risk sharing, access to knowledge, gains from research initiatives and expertise of others and new technologies (Chen et al., 2017; Kalyar, Shafique, & Ahmad, 2020) and may incur **disadvantages** such as loss of control on some processes, differing quality, problems in time scheduling (Kalyar, Shafique, & Ahmad, 2020).
- **SCM performance** may be enabled or hindered as a continuum, by the different **contextual conditions** of any player across the SC (Boehmke and Hazen, 2017; Flynn et al., 2010; Kalyar, Shafique, & Ahmad, 2020), since such different situations may disrupt or support each player operations.
- One cannot exclude the importance of SC players who act as **leaders and followers**, so that they all manage their operations effectively and efficiently.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI & Innovation: Movement of cash, information and physical items & and the challenges

- **SCI** is the **strategic collaboration** with its SC partners and manages inter- and intra-firm processes together (Flynn et al., 2010; Kalyar, Shafique, & Ahmad, 2020). SCI is about **cash, information and physical flows** to promote **value added operations** to customers and superior performance (Cuschieri, 2015; Ataseven and Nair, 2017; Kalyar, Shafique, & Ahmad, 2020; Hendijani & Saei, 2020; ; Zhou et al., 2020; Wei, Yin & Chen, 2021; Tian et al., 2021; Muafi & Sulistio (2022).
- **SCI** has an influence on the overall SC performance and also on the organisational performance within the SC. On the other end of the continuum, the **lack of SCI** may cause high inventory costs, less product quality, procurements delays among others (Seo et al., 2014; Kalyar, Shafique, & Ahmad, 2020).
- There are various scholars that consider that **innovation capabilities** are needed for long-term performance (Kim and Chai, 2017; Kalyar, Shafique, & Ahmad, 2020) since **innovation** encourages SCI with its internal and external relationships (Skippari et al., 2017; Kalyar, Shafique, & Ahmad, 2020).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: The key dimensions and its challenges

- SCI vis a vis the **internal, customer, and supplier relationships** respectively improves organizational productivity and profitability since the lack of SCI causes deficiencies in such outcomes (Gunasekaran et al., 2004; Kalyar, Shafique, & Ahmad, 2020).
- From another perspective some SC players may be **unable to wholly benefit from SCI** due to lack of information technology diffusion, managerial inefficiencies, and lack of financial funds (Coffie et al., 2020; Tian et al., 2021).
- To **achieve SCI** it is very challenging, since the **authoritarian traits of most SME owners**, prefer to lead and decide for themselves and without consultation, because of fear of losing trade secrets, and/or due to the rivalry between players (Donbesuur et al 2020; Tian et al., 2021).
- From another perspective, the **lack of SCI** is attributed to lack of communication, lack of resources, differing cultures and structures, lack of trust between SC players, misalignment of objectives, and pending conflicts (Fawcett et al., 2012; Tian et al., 2021).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Performance measures controversies

- Within the literature there are also some inconsistencies in particular themes such as **performance measures**, where some show the **impact of SCI on various performance measures**, such as Vickery et al., 2003; Zhao et al., 2013; Kalyar, Shafique, & Ahmad, 2020) and others show a **negative significant effect** of such a relationship, such as Koufteros et al., 2005; Swink et al., 2007; Kalyar, Shafique, & Ahmad, 2020) and others consider it with an **insignificant effect** (Flynn et al., 2010; Kalyar, Shafique, & Ahmad, 2020). Such a contrast may be attributed to the inconsistent and emerging **nature of SC integration theory**, the **contexts differences** and the different used **performance metrics** (Zhao et al., 2013; Kalyar, Shafique, & Ahmad, 2020).
- From the extant literature, it is clearly established that SCI has **various impacts on several performance measures** since it improves the **overall performance** indicators of both the organisation and the SC it forms part of (Kalyar, Shafique, & Ahmad, 2020; Afum, et al., 2020; Muafi & Sulistio, 2022), which is also clearly supported by the extant literature, where the **effective and efficient performance** have **SCI** as its antecedent).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Innovation and performance from a SC player perspective within the external contextual changes

- **Every SC player** needs to have a clear **strategic goal** to innovate and enhance firm performance (Donkor et al., 2018; Tian, et al., 2021).
- **Innovation** is about transforming products and/or services to **avail of opportunities, optimise the deployed processes** with improved efficiencies and **create and implement new ideas** to meet better the customers' needs and to achieve **customer satisfaction** (Gao et al., 2017; Tarafdar and Qrunfleh, 2017; Kalyar, Shafique, & Ahmad, 2020; Tian et al., 2021).
- Innovation makes the SC and its organisations more responsive to the **dynamic market** needs (Li et al., 2018; Kalyar, Shafique, & Ahmad, 2020) and is a product of **SC collaboration** and **integration** (Autry and Griffis, 2008; Soosay et al., 2008; Wu, 2013; Yang et al., 2015; Zhu et al., 2018; Kalyar, Shafique, & Ahmad, 2020) so as to meet **environmental changes** and **performance challenges** (Golgeci and Ponomarov, 2013; Kalyar, Shafique, & Ahmad, 2020).
- Furthermore, the **external environmental changes** create a **level of uncertainty**, which hinders any SC player to take accurate decisions to innovate based on the lack of quality information, difficulties in all its operations, and an ineffective management to meet and/or cope with the expected performance (Huang et al., 2014; Kalyar, Shafique, & Ahmad, 2020).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Innovation and technology deployment across the SC

- **Innovativeness** in SCs **enables SCI** both internally and externally between players based on new processes and integrated information technology systems [(Kim and Chai, 2017; Loon et al., 2017; Neutzling et al., 2018; Kalyar, Shafique, & Ahmad, 2020); Donbesuur et al., 2020; Tian, et al., 2021).
- Furthermore, **technological innovation** of any SC player will lead to improved productivity (Donbesuur et al., 2020; Tian, et al., 2021) such as managing people through the **digitalization of human resource management** (Strohmeier, 2020; Muafi & Sulistio (2022)) and the use of **digital technology for planning and executing supply chain functions** and creating new business models (Farahani, Meier & Wilke, 2017; Zhang & Sakurai, 2020; Muafi & Sulistio (2022)) and using excellent collaboration and communication capabilities through **dedicated hardware, software, and digital networks** (Büyüközkan and Göçer, 2018; Zhang and Sakurai, 2020; Muafi & Sulistio (2022)).
- Furthermore, the use of **Artificial intelligence (AI)** based on decision support systems, have analytical capabilities to work on big data, which deploys several sources of information and/or knowledge for more **effective and efficient decision making** to build on the **SC agility, robustness, transparency, and coordination** (Belhadi et al. 2021; Dohale et al. 2022; Dey et al., 2023).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Green manufacturing practices (GMPs), Industry 4.0, green SCI (GSCI) practices and sustainable performance

- After the “Brundtland report,” (UN, 1987) the environmental awareness, as one of the **triple bottom line (TBL)** dimensions, has been exponentially increased in society (Bai et al., 2020; Kiel et al., 2020; Jayashree et al., 2021).
- The current industry has generated several worldwide **environmental challenges** to respect (Afum, et al., 2020), including ecological hazards, climate change, and the overuse of non-renewable natural resources, which led to the deployment of the Fourth Industrial Revolution based on the **Industry 4.0 concept**. This approach led to **green manufacturing practices (GMPs)** with the mediating role of **green SCI (GSCI)** practices with other players to achieve **sustainable performance**.
- The **Industry 4.0 concept** refers to the use of **cutting-edge information technologies** to reduce the **human element** on all processes, based on a digital transformation platform across international borders, to all aspects of production, allowing us to form intelligent value networks like **artificial intelligence (AI)** and additive manufacturing in driving **sustainable processes across SCs** (Queiroz and Telles, 2018; Jayashree et al., 2021). These **smart technologies** improve collaboration and interoperability, resulting in an **advanced supply chain integration** approach (Macaulay et al., 2015; Jayashree et al., 2021) leading it to higher efficiency, liquidity, and flexibility with lower costs (Winkelhaus and Grosse, 2020; Jayashree et al., 2021). There are also **research controversies** within the latest literature, since one scholarly work demonstrated that **SCI is insignificant to Industry 4.0 implementation in SMEs** (Jayashree et al., 2021).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: GMP in the service sector & CE as a key approach

- The **Green Manufacturing Practices (GMP)** is also referred as **Green Intellectual Capital (GIC)** within the **service sector**, which is needed within the industry to drive SCI to achieve effective and efficient performance (Yong et al., 2019; Yusliza et al., 2020; Muafi & Sulistio, 2022).
- A **circular economy (CE)** based SC player, demands that one of its major objectives is to promote resources efficiencies and optimisation through the **reduce; reuse and recycle (3Rs) mindset** in all processes and to ensure **sustainable triple bottom line (3BL) operations**. Such dimensions refer to the **economic practices**, which are return on interest, sales, investment, etc; **environmental practices** which are the green operations such as carbon footprint and waste minimization, etc and **social practices** which refer to the respect of the employees and the community through best practices such as safety procedures, work life balance, less pollution to the neighbouring community (such as air quality); and quality of life (Glover et al., 2014; Hsueh, 2015; Dey et al. 2022).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Stakeholder analysis and management

- The literature established empirically that **internal and external stakeholders** influence the **decision-making process or management of SCI** (Zhu et al., 2013; Mensah, 2014; Konadu, 2020; Tian et al., 2021).
- Such **stakeholder pressure**, through various individuals and/or entities, such as customers, suppliers, competitors, industry associations, local communities, environmental organizations, regulators/legislators, media, and shareholders' funds, have a significant effect in improving the overall performance of firms, since they may have a monetary interest and others seek both environmental and social interests to promote their sustainability (Yu et al., 2016; Konadu, 2020; Tian et al., 2021). With such stakeholders' respect, there is less internal and/or external conflicts (Maas et al., 2017; Tian et al., 2021).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Competitive edge based on the Resource Based View (RBV) and Dynamic Capabilities (DC) seminal works

- **SCI** within an overall SC, with its integrated effort between all SC players, creates a **competitive advantage** over other non-integrated SCs, through both **implicit** (e.g. effective information management capabilities, and SC players hidden capabilities) and **explicit** (e.g. state-of-the-art automation, common standards across the SC, and standards operating procedures) **resources**.
- Such a **competitive advantage**, in line with **seminal scholars**, is achieved by the **firm-specific and difficult-to-imitate resources**, such as **physical assets** (e.g. dedicated assets), **financial management** (e.g. cash flow systems), **intangible assets** (e.g. track record) and **human resources capabilities** (e.g. people knowledge and expertise), as outlined by the **RBV of the firm** (Wernerfelt, 1984; Barney, 1991; Teece et al., 1997).
- Furthermore, Teece et al. (1997, p. 516) outlined that competitive advantage is enhanced through **DC** for the SC to meet the flexibility needed in the marketplace, by stating that: 'The firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments'. The above RBV and DC theories, were also referred by the current literature such as in **effective HR management and intellectual capital**, which need to focus on the skills and capabilities especially related to technology and knowledge management (Ahammad et al., 2020; Schniederjans, Curado, & Khalajhedayati, 2020; Muafi & Sulistio, 2022). **Intellectual capital** is needed to dynamically adapt to technology changes (Ageron, Bentahar & Gunasekaran, 2020; Ullah et al., 2021; Muafi & Sulistio (2022).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Servitization

- Nowadays, manufacturers are increasingly shifting towards **Product Service Systems (PSS)** by accommodating **servitization** within the SC, such as higher product customization based on more **value-added services** around the product, apart from the sale transaction itself (Brax et al., 2021; Masi et al., 2023).
- **Servitization** requires the **integration of capabilities from different organizations**, where employing SCI among SC players will promote improved performance, where operations go beyond the focal firm to include the **network of customers and suppliers** to improve on the given service/s (Vendrell-Herrero et al., 2017; Alkalha et al., 2022; Masi et al., 2023). Such SCI high level of collaborative efforts with all SC players including the end customer/s remain key for higher **servitization levels** (Chakkol et al., 2018; Masi et al. (2023)).
- Furthermore, **SC players positioned** at the downstream side of the overall SC, are in a favourable situation for achieving **higher servitization** since they can build up a stronger relationship with the end customer, being **positioned closer to the end users**, relative to other intermediaries (SC players) who are located on the other side of the SC (i.e. upstream side), unless the latter are assigned dedicated roles and special competencies, that closer SC players to end users cannot achieve (Szasz and Demeter, 2015; Masi et al. (2023)]. From another perspective, **highly vertically integrated SCs** may perform much better than others, where a SC player is directly engaged in different aspects of production, such as raw material processing, manufacturing, transportation, and retailing, since any SC player alone is able to self-perform more product related **value adding activities**, leading to faster, less costly and with more flexible processes, being **self-dependent** (Baines et al., 2011; Masi et al., 2023).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Supply Chain Quality management (SCQM) & Performance

- **Quality management (QM)** is key to most SCs products/services. **Supply chain quality management (SCQM)** has recently gained recognition as a competitive strategy that integrates the advantages of **supply chain management (SCM)** and **quality management (QM)** (Hong et al., 2019; Phan et al., 2019; Abdallah et al., 2023).
- The **concept of quality** dates back to various seminal works, based on a **high level of innovation capability and superior product quality** (Miller, 1988; Huo et al., 2014).
- QM is about internal quality improvements through continuous improvements vis a vis quality, efficiency, processes, procedures and systems (Bastas and Liyanage, 2018; Abdallah et al., 2023).
- As a result **SCQM** is considered to have an influence on **SCI**, which in turn the latter has an impact **effective and efficient performance** and on **MP** (Abdallah et al., 2023).

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED
QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: The SCI Conceptual framework

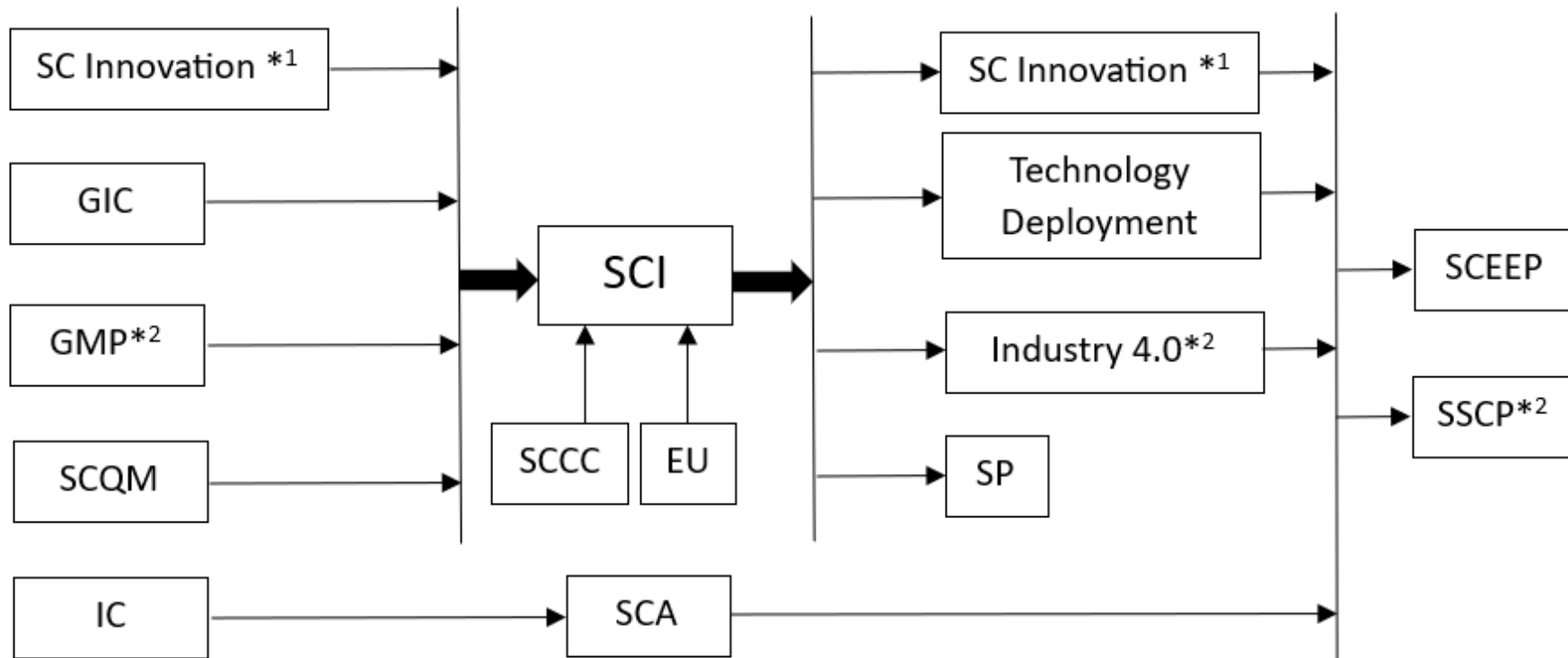
- The overall literature review clearly depicts the **comprehensive and holistic nature of SCI dimensions** with its properties and dimensions and the need for the development of **conceptual framework** that could be used across industries from a **holistic perspective** within both EU and other worldwide countries.
- The **SCI involves both internal and external aspects** of any SC since it consists of various players to complete a whole set-up to **design, implement and produce a product or give a service in line with GMP; GIC; IP; SCA and SCQM.**
- The key to SCI is to form a link with **upstream suppliers** and **downstream distributors/buyers/ customers** along with **total functional synergy internally** and with all these **SC players**. Therefore, integration could be achieved through three major interrelated activities – **customer relationship management, internal SCM and supplier relationship management.**
- The **role of technology** in line with Industry 4.0 standards are pivotal in today's environmental business challenges so as to act fast and promote **effective and efficient performance** to remain in business.
- All the above needs any business to take care of the environment, by respecting the **TBL** both for complying to today's **SDG goals** but also meet the current climate change challenges to promote **SSCP & SCEEP.**

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



The SCI Conceptual framework



ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Proposed Hypothesis

- H1. The contextual conditions of a SC are considered a moderator of SCM and SCI initiatives to achieve effective and efficient performance.
- H2. SCI with a level of innovativeness, as a mediator, leads to SC effectiveness and efficiencies of a firm within the SC.
- H3. The environmental uncertainty is a moderator of SCI to achieve effective and efficient performance.
- H4: Innovativeness is mediated by all SCI dimensions such as internal integration, supplier integration, and customer integration to achieve effective and efficient performance.
- H5: Technology based tools act as an enabler (a mediator) to achieve SCI which in turn improves performance.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED
QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



MCAST



SCI: Proposed Hypothesis

- H6: Green manufacturing practices (GMPs) needs SCI or GSCI (mediator) to promote sustainable performance, referred as the TBL or PPP (People, Planet & Profit).
- H7: Green intellectual capital needs SCI or GSCI (mediator) to achieve effective and efficient performance.
- H8: SCI is significant to the effective implementation of Industry 4.0 within in SMEs to promote sustainable performance, referred as the 3BL or People, Planet and Profit (PPP).
- H9: Stakeholder pressure: Stakeholder pressure mediates the relationship between supply chain integration and effective and efficient performance.
- H10: Intellectual capital (IC) leads to supply chain agility (SCA) to achieve effective and efficient performance.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Proposed Hypothesis

- **H11:** The more upstream a SC player is positioned across the SC (i.e. away from the end user), the lower the servitization level to the end customer will be achieved.
- **H12:** The higher is the vertical integration at product level (i.e. the more comprehensive range of activities under direct control of one SC player), the higher is the servitization level given to the end customer.
- **H13:** SCQM has an impact on SCI to achieve both effective and efficient performance and market performance.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Conclusion & Recommended Future Research

- **SCI is multidimensional concept.** The review of the existing literature was performed to **create a reference framework** on which future research could be based for the **consolidation of knowledge in SCI**. This would allow studying SCI across industries and regions, which will enable a benchmarking exercise on SC performance between different SCs. This study contributes to theoretical advancement of **SCI based on a holistic set of concepts**.
- It is recommended that the future research shall establish the validity of all **proposed thirteen (13) hypotheses**. The scope of this research paper was to explore the **significance of SCI role** and does not exclude any other type relationships that may bypass the SCI construct to achieve **SC effective and efficient performance (SCEEP) and/or sustainable SC performance (SSCP)**.

Various **literature gaps** were identified namely:

- The **innovation literature gap** refers to the lack of innovation concept within the SCI context exists. This research identified, as referred in both **H2 and H4 hypotheses** from the extant literature, that innovation can be both an antecedent and a mediator of SCI to achieve effective and efficient performance.
- The **GMP literature gap** refers to the lack of literature regarding the relationship of GMP to sustainable performance, where **hypothesis H6** outlined that GMP as an antecedent to SCI contributes to sustainable performance.
- The **servitization literature gap** refers to the lack of literature regarding the impact of SC on the service experience where the two **hypotheses H11 and H12** addressed such a gap, by outlining that the SC player position and the SC broad characteristic of the vertical integration both have a direct effect on the servitization level.
- The **SCQM literature gap** refers to the lack of literature regarding SCQM where the **hypothesis H13** addresses such as gap, by outlining that SCQM is an antecedent of SCI to promote both effective and efficient performance and market performance.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



SCI: Research Limitations

- This research takes a snapshot from several papers mainly based on the last ten years, where considering the holistic nature of the research objective, the **sample is considered limited** due to the **large volume of research available within the extant literature for each theme**.
- Hence, the **research scope was to touch the tip of the iceberg**, by making reference to the most valid journals in operations management, supply chain management and other disciplines, to derive the key concepts which are not fads but are the **foundations within the discipline of SCI** and are currently being used as a roadmap for all SC strategic and operations decisions, to guide the current industries worldwide
- The selection of themes behind SCI were based on the **key concepts emerged from the extant literature** in line with the **systematic approach** based on various journals, which are very relevant but does not exclude that other concepts may have been omitted from the set of propositions and from the derived conceptual framework.
- This study did not include **primary research** to validate the proposed **thirteen hypotheses** and the **conceptual framework**.

ENGAGING INNOVATIVE KNOWLEDGE THROUGH APPLIED QUALITATIVE RESEARCH

MCAST 2nd ANNUAL CONFERENCE IN QUALITATIVE RESEARCH METHODS



THANK YOU

