Supply Chain Practices and Working Capital Theory: A Goal-Interdependence Perspective

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By

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Abstract

Organizational functions and processes have been historically separated into specializations requiring specialized knowledge, skills, and responsibilities. However, very rarely is a process performed entirely by one person or department in the organization. Highly likely, a process is conducted, or requires the assistance of another person or group of persons, or even another department, and whose members may have their own structures, schedules, and schemes of pursuing a particular task. While this configuration has lasted for a long time, and may have its advantages, it has been argued that it leads to inefficiencies, and creates an environment in which individuals feel constrained and believe that their primary goals are to complete their stated responsibilities (Bennis and O'Toole, 2005). But, as modern supply chains become exposed to various interruptions, managers believe that a cross-functional orientation could help companies to discern and mitigate such interruptions.

This study utilizes the features of goal interdependence to investigate the cross-functional relationships between two of the primary business functions, namely operations, and financial management, with particular reference to supply chain management and working capital policy, in a metalworking and maintenance, repair, and operations (MRO) products and services firm in the United States. The study uses an explanatory sequential mixed methods design (Creswell, 2017), grounded in the action research methodology. Quantitative data were collected through closed-ended questionnaire, and analyzed using correlation analysis. Subsequently, qualitative data were collected through observations and semi-structured interviews, and analyzed using thematic analysis and Cronbach's Alpha. The findings of the study indicate that despite an understanding that supply chain and working capital management are essential functions for company success, human attitudes seemed to impede the coordination of the processes between the two functions, and were influenced by a lack of knowledge sharing and unwillingness to collaborate. The

intervention revealed that individuals were more willing to work together if they knew the practical complementarity between the functions.

Declaration

I, Michael Adams, hereby certify that this DBA Thesis is the product of my own work, that the works of other researchers have been duly acknowledged, and that the central ideas in this Thesis constitute my original thinking, and as far as I am aware, not presented to this or any other institution for the conferment of a degree.

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Acknowledgement

I am very indebted to the many individuals who have contributed to the materialization of this thesis, and to the evolution of my interest in the virtues of action research. I owe a special debt of gratitude to Dr. Jim Hanly, the primary supervisor of this project, for his patience, unrelenting encouragement, and an almost solicitous insistence that I finished the thesis. I am also incredibly grateful to my colleagues at SUNY, College at Old Westbury, who constantly pushed me to complete the thesis, and to anticipate the satisfaction to be achieved in the end. To the participants and management at SCM Tools, I am appreciative of the help and data you provided.

CHAPTER 1: INTRODUCTION

1.1 Background, Context, and Definitions

Business organizations are typically structured in the form of functional departmentalization which is characterized by the arrangement of departments based on functional specialties and responsibilities, and staffed with personalities with varying educational and experiential backgrounds to conduct activities and processes that should be aligned to benefit the organization (Porter. 1998). However, it has been found that this structuring often leads to independence of actions rather than to the intended goals of interdependence and collaboration (Deutsch, 1949). Sometimes it is not the structure of the business processes, nor the defined roles of the functions that drive success, but rather a combination of the perception of those roles, the willingness of people to understand and connect those roles, and the understanding that the achievement of personal and organizational goals is dependent on the knowledge gained and shared among functions. The merging of these disparate variables to form a cohesive enterprise is sometimes daunting (Porter, 1998).

My initial view of the work environment at CSM Tools (a pseudonym) for the firm studied in this research, was that that functional departmentalization was more disadvantageous than advantageous. Individuals were focused on the accomplishment of their prescribed duties, while ignoring processes and activities that they thought were unrelated to those same duties. So, it was a matter of how they perceived the roles and duties rather than the end product. Individuals would engage in cross-functional coordination only when they thought it was absolutely necessary. This interaction was evident at the end of each month when all resources had to be combined to produce the Executive Report. Parson's (1961) proclamation has relevance here. Firms are composed of individualistic and collectivistic interests that are difficult to reconcile without understanding the inner workings of the organizations, and the contents of organizational processes. The initial assumption was that individualism was the normal course of action at CSM Tools, so I decided to go along with the apparently general customs.

However, several factors led my decision to undertake change in the company, especially in the departments with which I had to work, namely, finance and operations. (1) The Comptroller's Statement in the 2010 Annual Report points out that organizational goals are not being met (2) The company has been adversely affected by the 2007-2008 financial crisis (3) There was a rift between the finance and operations departments regarding who should be responsible for risk oversight of the several customers who defaulted on payments causing a steep loss in revenues (4) My growing with having to deal with various individuals that seemed to want to working independently of what I was assigned to do. The lack of collaboration among employees was obvious. Collaboration was a buzzword in the firm, but as Porter (1998) states, many organizations use the word collaboration implicitly in speeches and meetings, and while they understand the advantages of a collaborative environment, they do not understand how to promote it.

Having read Deutsch (1949) that inter-departmental conflicts could be the consequence of poorly aligned goals and the function-specific roles that are an abiding part of the structures of many organizations (Porter, 1998), the construct of goal interdependence seemed a particularly good idea to use to pursue collaboration between finance and operations management at CSM Tools. Goal interdependence is predicated on the principle that collaboration and interdependence among business functions are essential to building team effectiveness and organizational success. Also essential to the study of goal interdependence is the examination of human behavior in the execution of activities, and how they perceive their roles in the attainment of organizational goals (Lu and Tjosvold, 2015).

As idea for the study developed, an article by Hofmann and Kotzab (2010) became the inspiration for concentrating on the relationship between supply chain management and working capital policy. Supply chain management and working capital policy are functional processes under the operations and finance departments, respectively. As Zhao and Huchzermeier (2019) explain, operations and finance are two sides to an organization's performance. Operations management transforms inputs into outputs, and finance provides the funding for that transformation process. As such, it is counterproductive for both functions to work independently. Their mutual goal should be geared towards the ultimate financial performance and competitive advantage of the firm (Zhao and Huchzermeier, 2019).

Definitions of Terms and Relevant Comments

At this point, definitions of the main concepts to be used throughout the study are needed.

1. **Supply chain** is a network of suppliers and distributors within the value chain engaged in the flow of goods, services, finance, and information required to satisfy the demands of the end customers.
2. **Supply chain management** is: "*the systemic, strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.* (Source: Mentzer, 2004, p. 4).
3. **Supply chain management practices:** the set of actions taken by a company to encourage effective management of its supply chain (Li et al., 2006).

Supply chain management has various definitions in the literature (Mentzer, 2004), but this definition is particularly relevant to this study because it includes the concept of cross-functionality within a particular company that is a central focus.

4. **Value Chain** is the strategic emphasis on pricing policies, and cost-effective services aimed at creating value for the firm and its customers.

5. **Working capital** is more consistently defined in the literature as current assets minus current liabilities. Current assets are comprised of cash, accounts receivable, inventory, securities and cash equivalents, and current liabilities include accounts payable, short-term debt, notes payable, and accruals. For the purpose of this study, the main focus will be on accounts payable, accounts receivable, and inventory, as these are the variables with which employees in this particular setting of CSM Tools work. These variables will be developed and explained later in the study.

6. **Cash Conversion Cycle (CCC**) is the length of time between a firm's expenditures for inventory and the receipts of payment from the sale of that inventory. That is, the length of time the firm has funds tied up in the management of its inventory.

7. **Goal interdependence** is the realization among groups that working cooperatively is more efficient and rewarding than individually pursuing a specific objective.

In the context of this study, goal interdependence refers not only to a convergence of the goals between working capital and supply chain management, but among the goals of the organization and those of individuals.

Other terms that need defining in the study are defined appropriately as they are used.

1.2 Statement of the Problem

Finance and operations are two of the most important departments in a corporate firm, and the efficient management of functions within these departments is pertinent to the survival of the firm (Zhao and Huchzermeier, 2019). In particular, finance and operations mutually support the distribution of goods and services as there needs to be an efficient movement of not only goods and services, but of financial resources to avoid supply chain interruptions (Wetzel and Hofmann, 2019; Lambert and Enz, 2017). Considering that CSM Tools is a distributor of metalworking and maintenance, repair, and operations ("MRO") products and services, and spans both upstream and downstream operations the industry's supply chain, it was important to change the perceived lack of communication mentioned earlier between employees in the finance and operations departments at CSM Tools. Further highlights of CMS Tools are provided in the next section entitled "Overview of CMS Tools."

Firms depend on teams to market goods and services, but the inherent specialization of those teams often hamper communication and transfer of knowledge that are crucial to the smooth flow of those goods and services. Lu and Tjosvold (2013), and Deutsch (1949) argue that isolationism and specialization in terms of functions in organizations create problems that have given rise to goal interdependence as a way cut across a discipline-dominant culture and structure, and to provide some purpose for the establishment of organizations that are expected to operate as a unit. In this context, this study concentrates mainly on the problem of getting individuals in the finance and operations departments to understand the interdependent goals of supply chain management and working capital policy, but the discussion makes constant reference to the major departments because it is often customary in business to speak of the decisions made by the major functions.

Lu and Tjosvold (2013) mention that it is not unusual for individuals even in the same departments and functions to work independently. They find that the idea of working towards a common goal is not as easily achievable as most people believe. There are myriad personal goals that are challenging to reconcile with those of the organization. In fact, as the authors indicate, the alignment of personal goals with those of the firm is not one of the major concerns of management. In interviews, management may try to see how the goals of the individual may align with those of the firm, but that desire seems to dissipate as duties are performed.

This view is consistent with the behavior of individuals at CSM Tools. The general perception of supply chain management is that of a function that is responsible for the distribution of goods to customers. As Christopher (2016) notes, this is a very narrow view of the supply chain, which he believes originated from the historical impression of the supply chain as merely related to manufacturing and transportation. That impression does not seem to evolve with time and the transformation of the business environment into a holistic system. In the same vein, working capital is presumed to be narrowly circumscribed as the difference between current assets and current liabilities, but the strategic implications of working capital for the entire business operation is ignored by even the individuals who are responsible for its execution (Wuttke et al., 2016). Examined within their narrow scopes, therefore, it would seem that working capital and supply chain management have nothing in common, and unfortunately, this is the general feeling of many (Zhao and Huchzermeier, 2019; Hofmann and Kotzab, 2010). These assertions were confirmed as I spoke with employees at CSM Tools about supply chain and working capital management.

As argued by Wetzel and Hofmann (2019), but mainly from a posture of inadequate levels of working capital within the supply chain, there is a problem of misunderstanding within finance and supply chain that transcends those functions, and is causing a more systemic problem, not only for the focal firm, but for the entire business landscape. The objectives of working capital and supply chain management are not clearly understood. In light of this misunderstanding, this study seeks to narrow that gap both in the literature and in practice, by demonstrating to employees at CSM Tools how the goals of supply chain and working capital management are related, and how an understanding of those goals can enhance functional efficiency, customer satisfaction, personal satisfaction, and organizational value. Porter (1998) argues that competitive advantage and the survival of any organization depends to a greater degree on the employee's comprehension of the objectives and goals being pursued than merely on the knowledge of how to perform tasks. When one understands the reason for the activity, one has more appreciation for such an activity, and one will seek ways of performing the activity more efficiently. Pearsall, M. and Venkataramani, V. (2015) suggest that an understanding of goals brings a high degree of mental focus that is beneficial to individual and organizational performance.

It is for the above reasons that this study utilizes the tenets of goal interdependence as a mediating tool for showing individuals at CSM Tools how supply chain and working capital management are related. There is the need for them to relinquish what Ellinger et al. (2011) call the institutionalization of functional concepts aimed at taking advantage of the diverse capabilities of individuals to satisfy a broad spectrum of customers served by the organization. However, this separation of duties has impacted knowledge sharing, and changed the organization into a system in which accountability for business failure rests not on the overall inefficiency of the firm, but on separate departmental capabilities. At CSM Tools, for instance, and discovered by Wetzel and Hofmann (2019) in their examination of the relationships among business functions, bottom-line success seems to be attributable to the finance department that formulates the financial planning for the firm, but failure seems to be charged to operations and management inefficiency. In a quest for that shared vision for the organization, and dissatisfied with the segregation of performance, Kaplan and Norton (1992) proposed the Balanced Scorecard to call attention to the need for an integrative organizational and evaluation philosophy. The authors believe that the overall goals of the organization are achieved as a unit rather than as separate functions and initiatives.

Transferring this integrative view to the management of working capital and supply chain at CSM Tools meant that there should be a way to get individuals to understand that the two functions are more interrelated than unrelated. Moreover, CSM Tools insists on customer satisfaction, efficiency, and profitability for both the firm and its customers. Customer satisfaction is supposed to be the responsibility of all employees, but the corporate, business, and functional structure of the company puts the onus on supply chain management specialists for customer satisfaction. However, as Lam et al. (2019) posit, customer satisfaction and profitability are interrelated, which should make the relationship between working capital and supply chain management an important concern for management. Additionally, the supply chain is supposed to be an all-encompassing function responsible for integrating business processes (Christopher, 2016), as the organization tries to distribute goods as cost-efficiently as possible to customers.

While functional integration can be advantageous for organizational performance as many researchers have pointed out (Christopher, 2016; Malhotra and Mackelprang, 2012), some individuals express skepticism because they feel that they will be ineffective if they have to work in different areas. In fact, some individuals at CSM Tools scoff at the idea of cross-functionality. As employees become entrenched in their jobs, it is more challenging to change their habits, especially if they have not been encouraged to change at any point (Porter, 1998). This has been the case at CSM Tools, where several of the decision makers have been with the company for several years, and have not changed their approach to work. So asking them to embrace change would be challenging. But, as pointed out in the introduction, the post-financial crisis showed that finance and operations were at odds because of the lack of a smooth flow of information, and that resulted in a shortage of working capital. That period of financial stress awakened management to the fact that working capital was as much as valuable as capital budgeting concerns to the firm.

The question was: How to achieve that focus? The organizational culture and the delineated structure of business functions seemed that it would be too much to launch a successful intervention. Nonetheless, since the organization emerged from the financial crisis with the knowledge that working capital is needed to drive the supply chain, and the organization as a whole, it seemed that any research to expand and disseminate that knowledge would be a welcomed pursuit. Thus, as Gagne (2018) explain, a clarification of functional goals could bring a high level of self-determination and motivation, which can lead to positive organizational change. Ellinger et al. (2011) note that self-determination could help to highlight the balance between performance and outcomes. Individual can perform at a high level, but the outcomes may not be reflective of that performance. This encapsulates the problem at CSM Tools. Individuals showed that they were accomplishing assigned tasks, but the amount of time taken to accomplish those tasks, may be too long due to inefficient performance.

The problems faced by CSM Tools as it tried to navigate the uncertain business environment were expressed by management in certain questions, three of which were: 1) In what ways could communication be improved across departments? 2) What challenges are encountered in exploring the relationships between departments, and 3) Can an understanding of goals help to improve efficiency? These questions were especially noteworthy because they form the basis of the investigation conducted in the present study, and give birth to the research questions cited later.

1.3 Overview of CSM Tools

CSM Tools was founded in 1941 by a family in New York, USA. It is one of the leading distributors of metalworking and maintenance, repair, and operations (“MRO”) products and services, with its main headquarters in Melville, NY, and a co-headquarters in Davidson, North

Carolina. Products range from safety and janitorial products to large cutting tools. The company averages approximately $780 million in sales per year. It has since then carved out a competitive niche, with fulfillment centers in the United States, Canada, the United Kingdom, and other countries around the world. There are 85 branch offices (84 in the United States and one in the United Kingdom). The company boasts a crew of more than 5,500 associates who bring a wide range of expertise and insights to help the company to pursue its main objective of servicing its customers. The large number of associates present difficulties in monitoring performance, and the rapid turnaround time that the company desires preclude constant and formal employee interactions. Approximately 750 employees are at the Headquarters in Melville, NY. Investigating the impact of employee group size on efficiency in manufacturing firms in Europe, Forés and Camisón (2016) find that smaller groups tend to work more efficiently, even though the culture of the organization has a moderating effect on the results. Firm size can impact the extent to which individuals react to strategic objectives set by management.

CSM's maintained steady average sales of $2.5 billion between 2010 and 2018, but experienced a decline in sales declined by 5% 2019 due to consolidated spending by many of its manufacturing customers. The company however, posted 2019 fourth quarter sales of $842.7 million, up 0.6 percent year-over-year, due to the sale of two of its low-performing sectors. Operating income for the same period decreased 16%, while total net profit was down 8.8%, but the CEO expected better growth prospects for the company driven by improved demand and market share gains from smaller local and regional distributors.

CSM Tools mission is to be" the best industrial distributor in the world, as measured by our associates, customers, owners, and suppliers." (2016 Financial Statements, p. ii). 2016, and being at the center of a competitive supply chain (figure 1), efficiency, communication, and tight

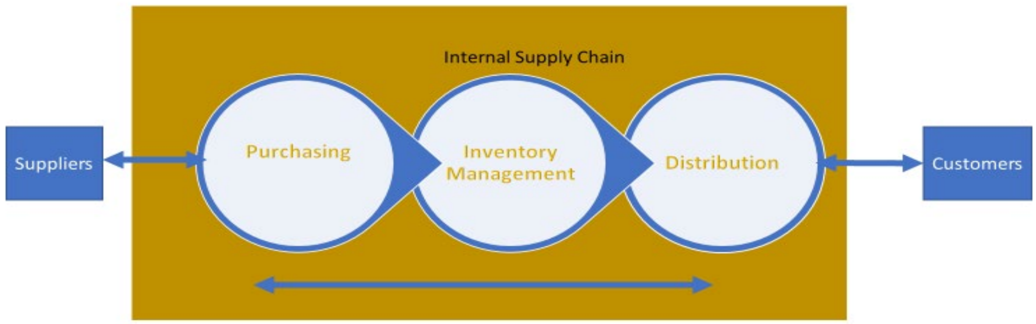

Figure 1 CSM Tools Supply Chain Processes

interrelationships (Lu and Tjosvold, 2013), and the understanding of the objectives of the total system and supply chain (Wetzel and Hofmann, 2019), are key to fulfilling that mission. The company operates in a highly fragmented, but competitive industry, with the top fifty companies representing less than 30% of the market share, of which CSM accounts for only 2%. Customers include Fortune 1,000 companies, government agencies, and other small firms. The company markets its products through several sources, including its master catalog, promotional mailings and brochures, telemarketing, and the internet. CSM Tools stocks more than one million products from approximately 3,000 suppliers. The company's central focus is on the movement of goods and services, and this emphasis is repeated daily by top management.

The company sells a large variety of metalworking products ranging from cutting tools to machinery, to hand and power tools to electrical supplies, abrasives, and electrical supplies" (Company Catalog, 2016). Approximately 85 percent of the company's products are found in its inventory, so orders for these in-stock products are processed and fulfilled the day the order is placed. The company operates a centralized inventory planning system in the state of North

Carolina, but supply chain specialists are in separate locations to assist with inventory costing and customer demand fulfillment. Some orders are shipped on a next-day basis if they are placed by 8 p.m. Eastern Time. The company believes that good customer relationships are one of the main revenue-generating resources, and one of its goals is to make product ordering as convenient as possible, so customers can choose among many convenient ways to place orders, such as online, eProcurement platforms, call centers, or direct communication with our outside sales associates.

One of CSM Tools' most important concerns is cost management. The company believes that if costs are controlled, it will be better able to service its customers, compete more efficiently and effectively, and to help customers to be more cost-efficient and profitable. Associates are advised to help customers to reduce operational costs so that these customers can drive their business, which will in turn drive CSM Tools' business success. The company believes that helping firms along the supply chain is beneficial to the survival of the entire chain. In fact, the main company's main goal is expressed as follows in the Financial Statement Overview: "Our goal is to drive results for their (our customers) businesses - from keeping operations running efficiently today to continuously rethinking, retooling, and optimizing for a more productive tomorrow."

Timely shipping, the consolidation of multiple purchases into a single order, and providing a single invoice for multiple purchases over time help customers to minimize administrative costs. Operational dimensions of speed, quality, cost, dependability, and flexibility are enhanced in order to generate cost savings for the company and its clients. CSM Tools' management believes that customers are better served when there is coordination, and when employees are informed, so associates are trained to adopt a multiple-lens approach (Christopher, 2016) in dealing with customer demands and inquiries. Customer relationship management, demand management, order fulfillment, supplier relationship management, and returns management occupy the daily activities of the supply chain and operations crews. Management frequently expounds the belief that these different management activities should be understood and practiced by all supply chain specialists. In doing so, the company has, wittingly or unwittingly, has structured the business processes into specified roles, and might have contributed to the lack of cross-functional integration mentioned above, and which is central to this study.

At the same time, however, management has emphasized, and been in search of a smooth flow of information across functions with a view of enhancing performance in the face of intense competition. Porter (1998) notes that effective communication among a firm's departments is challenging due to the various personalities that are involved, the management training they received, a lack of understanding of what each department does, and the extent to which individuals in the departments perceive their roles as interdependent with the overall performance of the firm. It could be inferred, based on the situation at CSM Tools, that this idea is more appealing in theory than in practice because I have not noticed this formal collaboration. Barney (2001) argues that the ability to integrate capabilities among departments is an issue that persists in firms due partly to the communication and logistical challenges involved in accomplishing it.

As depicted in Figure 2, the supply chain is a continuous flow of material, information, capabilities, and finance, indicating that a combination of resources needs to work together to facilitate the process. What may be missing from the emphasis on supply chain management at CSM Tools is the financial flow, which Christopher (2016) highlights as one of the main omissions by several supply chain managers as they try to devise strategies for their supply chains. I observed that omission as at CSM Tools as well, as individuals in finance did not have much informal interaction with individuals in supply chain management.

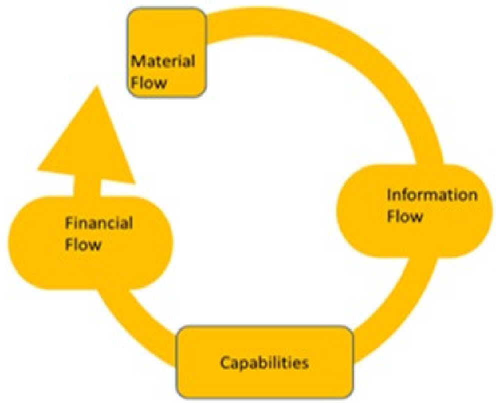

Figure 2 Interdependent Flow in the Supply Chain (Source: Chopra and Maindl, p. 27).

Blome, Schoenherr, and Rexhausen (2013) argue that informal communication and collaboration are an effective epistemological tool when an organization wants to build trust, disseminate information, and examine connections among processes, especially when there is no formal training provided.

Management states that the operation of the company is affected by operational and economic risks and uncertainties in the inherent in the business environment, and it is important for both employees and customers remain vigilant. But, also important is that the company creates an internal environment in which employees become the monitors of one another. That would mean looking for dependencies among departments and functions because as Lu and Tjosvold (2013) postulate, the ability of one department to achieve its goals is dependent on the ability of other departments to achieve their goals, and to know what is necessary to ensure that all goals are met. This is a lesson for CSM Tools.

1.4 The Purpose of the Study

Interdependence has become a very pervasive term and research topic in business today, and is an important concept through which to examine how effectively goals are achieved in organizations especially at a time when management is trying to find ways to be cost-effective. The purpose of the research was to help individuals in finance and operations management, and mainly in working capital and supply chain management to coordinate their roles and goals in order to work more efficiently and purposefully. Using the philosophy of goal interdependence, the study hoped to bridge the divide between working capital and supply chain management that seemed to be antithetical to the wishes of management for integrated business functions that would be a better way to service customers. The study was aimed at examining the impacts of individual attitudes, perspectives, and knowledge of the goals of the two functions, and how those goals coordinated with the goals of the firm.

Observations of, and conversations with employees revealed that collaboration among individuals was a necessary ingredient to the achievement of efficient performance. On the one hand, some individuals expressed interest in learning, and they believed that an interface between finance and operations management was an interesting subject to explore. On the other hand, others were apathetic. Goal interdependence theory teaches that as people realize that within a particular organization goals cannot be so different that they cannot be coordinated, so dialog can function as a tool to build a team. Continuous improvement is an abiding philosophy in supply chain management, and is hinged on collaboration. Thus, the study seeks to create an awareness that cross-functional collaboration can enhance customer relationships, one of the primary goals of CSM Tools. Improvements in customer relationships are stronger when the firm emphasizes internal collaboration among departments, making sure that the goals are aligned (Lu and Tjosvold, 2013), and in the case of CSM Tools, when the financial goals complement the supply chain activities (Zhao and Huchzermeier, 2019). As such, the primary question that guided the study is: **In what ways are supply chain practices and working capital theory interdependent?** Secondary questions are:

1. What challenges are encountered in exploring the relationship between working capital and supply chain management?
2. Can an understanding of goal interdependence encourage collaboration?

The purpose of the current study was, therefore, twofold: 1) to examine the antecedents and consequences of the relationships between working capital and supply chain management in an organizational context in order to determine both qualitative and quantitative variables that could impact those relationships, and 2) to add new insights into extant research on the complementarity between working capital and supply chain management, and the importance and influence of goal interdependence in bridging working relationship gaps.

1.5 Conceptual Framework

A conceptual framework for assessing the relationship between supply chain practices and working capital policy is proposed and explored within the context of a supply chain distributor. In contrast to extant research on that relationship, this study includes not just the link between the two processes, but also the role played by individuals in facilitating or impeding that link. The CCC is frequently discussed as the overlap between working capital and supply chain management, but the proposed framework in this study utilizes goal interdependence theory as a scaffolding that contextualizes the research within a goal-oriented initiative, and provides motivation for the research questions stated above.

This study seeks to discuss the connection between working capital and supply chain management via the use of the goal interdependence framework (Lu and Tjosvold, 2013; Deutsch,

1949) (Figure 3) that argues that for success in organizations, among individuals, and within processes, a focus on goals tends to lead to greater communication, efficiency, and success. As the definition of goal interdependence above shows, individuals should be made aware that working independently is acceptable, but working cooperatively is more beneficial to the group. Goal interdependence shows that relationship conflicts are reduced because everyone is motivated to reach a common destination that they believe will be beneficial to all parties. Deutsch, Coleman, and Marcus (2014) claim that individuals and groups work to further their self-interests and strive to attain their goals. However, the pursuit of self-interests and individual goals should not preclude the development of effective organizational relationships, especially through knowledge sharing.

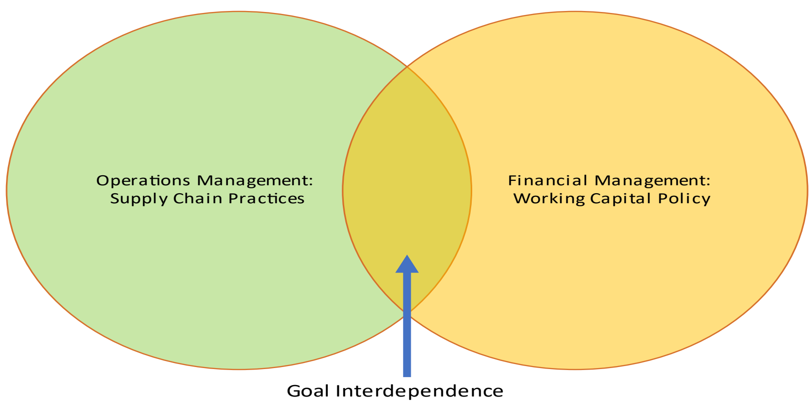

Figure 3 Conceptual Framework for this Study

One important revelation of goal interdependence if that people do not recognize the significant roles others play in the pursuit of their goals. Despite the fact that individuals may believe that they are working independently, their independence is connected to the efforts of others. In the case of CSM Tools, for instance, working capital and supply chain management perform independent and distinctive roles for the company, but their objectives intersect at the overall firm value-maximization. As the CSM management reiterates constantly, value is created through cooperation and the sharing of pertinent information that can support the supply chain. This is the essence of goal interdependence. As pointed out earlier in the introduction, the failure of companies during the financial crisis ultimately lay at the feet of all parties involved, and goal interdependence theory accepts that holism should supersede individualism (Deutsch, 1949). In that sense, in terms of this research, working capital seeks to provide the cash flow necessary for the supply chain to operate, and the operations of the supply chain create the funds to keep the organization operating, especially in the short term. By strengthening its liquidity position through the efficient use of working capital, the firm builds its profitability through the efficient management of supply chain resources (Zhao and Huchzermeier, 2019).

Goal interdependence theory has emerged as an important lens through which to evaluate human behavior in complex organizational settings (Lu and Tjosvold, 2013), and it offers the researcher and other participants in this study the opportunity to reflect on socialization patterns at CSM Tools, and to examine how individual goals are embedded in the goals of the organization despite the perception that both sets of goals are sometimes irreconcilable. According to Deutsch (1949), team members should be made aware of the benefits to be obtained from the organization when they try to look beyond their own idiosyncrasies and desires, because it is through self-examination that one realizes that there are more similarities than differences.

The goal interdependence framework informs the concept of shared vision in cross-functional coordination (Tsai and Hsu, 2014). The concept of coordination defines supply chain management whose success, according to Houston, Lin, and Zhu (2016), relies on team performance. In fact, coordination implies that a certain level of socialization is assumed. People should be willing to make the effort to work as a team for goals to be effectively and efficiently achieved. It may be an unconscious effort (Deutsch (1949), but its presence is an ameliorating factor in making everyone feel less threatened, and less willing to retreat from the group. This study uses the explanatory mixed-methods design (Creswell, 2017) to investigate the effects of teamwork on individual attitudes and performance in the two business functions at CSM Tools.

1.6 Professional Rationale of the Study

This study is significant because of its practical implications for employees within the organizational setting at CSM Tools, especially for the insights it presents to employees in terms of working together to achieve goals. Management encourages cross-functional collaboration, and individuals do understand from an intuitive standpoint the importance of collaboration, but they are not practically engaged in a process to see how collaboration could help them to work more efficiently, and to make their interactions more pleasing. Through action research, this study can help to reinforce the theoretical knowledge that individuals have regarding cooperative goal achievement, can reinforce management's call for departmental collaboration, while at the same time, demonstrate how that knowledge could be translated into practice.

Several "anonymous employee complaints" on "Indeed.com", an international job site, provide two diametrically opposed views of CSM Tools. The comments range from an "unfriendly environment in which to work," to an environment that is "friendly and empowering." Some of them state that management does not care about their wellbeing, and that they are left to do things on their own, with minimal support. Actually, one objective of CSM is to allow employees to think independently. It might be that employees have misconstrued the "independent thinking," and thus have created the anti-social culture that has made some uncomfortable. One employee stated that she "felt uncomfortable asking questions" because she might be ridiculed.

Deutsch, Coleman, and Marcus (2014) analyze the feeling of isolation that individuals feel in organizational settings that individuals feel deprived of the protection and confidence that are necessary for organizational success.

The development of organizational strategies incorporates the resource-based view of the organization (Sirmon et al., 2011; Barney, 2001) that is an important part of the organization's ability to compete, and in the modern supply chain that is fraught with uncertainty, the utilization of resources should be done in collaboration with role and goal congruence (Zhao and Huchzermeier, 2019). Cooperative organizational goals form the basis of goal interdependence (Lu and Tjosvold, 2013) that affects not only intra-organizational interaction patterns, but also, as Zhao and Huchzermeier (2019) posit, determines how supply chain activities are devised and coordinated to affect business competence and outcomes.

This study seeks to demonstrate to individuals how the achievement of synergies not only facilitates goal achievement, but encourages individuals to establish an environment in which collaboration can thrive. According to Creswell and Plano-Clark (2017), by employing explanatory sequential mixed methods research, this study builds on theory, and tries to show how that theory can be employed in a business environment to strengthen efficiency, which is the goal of action research (.

This study, though limited to two departments, can enlighten management and other employees that working across functions can improve productivity within the organization, and can extend to upstream and downstream activities because the actions of CSM Tools impact both upstream and downstream partners.

1.7 Scope of the Study

The study focuses on showing the functional relationships between the finance and operations management departments at CSM Tools, with particular reference to working capital and supply chain management. The research utilizes goal interdependence theory as a predicate for the discussion because goal achievement is relevant to the relationship between the two functions, and it is one of the ultimate objectives of the firm. An important feature of the relationships between the two functions is the willingness of employees to understand and use those relationships to help them work more efficiently, and to better serve the organization. As Lu and Tjosvold (2013) point out, goal interdependence purports to reveal the extent to which individuals perceive their goals to be conditional upon the achievement of team and organizational goals. The creation of an awareness of goals and how they interface are one of the main teachings of goal interdependence theory. Myriad goals coexist in the organization, but individuals may not be aware of the goals others are pursuing unless there is dialogue occurring simultaneously with individual actions and duties. The action research methodology used in this research allows individuals to reflect on their roles, and the importance of those roles and their personal behavior patterns in the overall scheme of the organization's operations and goals.

One limitation of the research is that it while it tangentially includes resources from other departments, it could not go beyond the two main functions because of many challenges in the business workplace. Those challenges are explained throughout the study, particularly in the methodology, analysis, and conclusion. The time-consuming nature of the research, and the time constraints imposed by CSM Tools limited me to a very small sample size and research scope.

1.8 Organization of the Thesis

In the foregoing sections I introduced the nature and objectives of action research study. The 4 chapters that follow are: Chapter 2: Literature Review provides and analysis and synthesis of relevant extant research on the relationship between working capital and supply chain management, the goals of working capital and supply chain management, antecedents and consequences of goal interdependence, the cash conversion cycle as a bridge to between working capital and supply chain management, financial supply chain management as a modern construct, and the influence of human decision-making in the achievement of organizational goals. The chapter concludes with a summary of how the core literature is connected. Chapter 3: Methodology addresses the action research philosophies, and their suitability for this research. Also discussed is the relevance of explanatory sequential mixed methods research, and the data collection and analysis undertaken in the study. The chapter concludes with ethical considerations in action research and research in general.

Chapter 4: Results and Findings discusses the findings from the interviews, observations, and questionnaires, as well as the quantitative data and their relevance to the research. Chapter 5: Discussion, Implications, Limitations, and Further Research gives an overall picture of the research, and reflections on my development as an insider-researcher. The answers to the research questions, implications for management, limitations of the research, and suggestions for further investigation are presented.

CHAPTER 2: LITERATURE REVIEW

2.0 Overview

Extant research has provided limited scope of the relationship between working capital and supply chain management, mainly focusing on the working capital as important for liquidity and profitability (Zhao and Huchzermeier, 2019; Hofmann and Kotzab, 2010; Richards and Laughlin, 1980). The authors posit that working capital and supply chain management are two sides of the same coin aimed at achieving the firm's financial goal of shareholder value maximization, and hence, the sustainability of the firm (Zhao and Huchzermeier, 2019).

The purpose of this study if to examine the relationship between working capital and supply chain management from a goal interdependence perspective. To do this in the context in which there is limited research on the goals of the functions, I have borrowed from goal interdependence and behavioral theories. This study also uses the cash conversion cycle as a link between the two functions, one of the common threads in the extant literature. While perusing the literature, I found that several authors hint at the goals of working capital and supply chain management, so, inspired by the recommendations of Bendoly, Van Wezel, and Bachrach (2015) that an understanding of goals is complementary to an understanding of inter-functional coordination, and Deutsch's (1949) exposition of how the interdependence of goals is a pathway to understanding certain complex phenomena, such as the impact of human motivation on organizational operations, the goal interdependence theory seemed to be a suitable conduit or mediator for discussing the relationship between working capital and supply chain management in an organizational setting. As Porter (1998) notes, companies have predetermined goals that human beings are expected to achieve through their decision making.

There has been a change from a two-functional, single-organizational discussion of the relationship between working capital and supply chain management (Hofmann and Kotzab, 2010; Richards and Laughlin, 1980) to a more transactional view including financial institutions in the form of factoring, inter-organizational relationships, and the managerial and strategic flows of finance in the supply chain (Wuttke et al., 2016). This change was necessary because much of the main research on supply chain and working capital is dated (Hofmann and Kotzab, 2010; Timme and Williams-Timme, 2000; Richards and Laughlin, 1980), and mainly concentrated on the cash conversion cycle (Zhao and Huchzermeier, 2019), without examining the central goals of each function even within that cash conversion cycle framework. In reconsidering the usefulness of the cash conversion cycle phenomenon in the relationship between working capital and supply chain management, Wetzel and Hofmann (2019) state that functional relationships should be examined from a collaborative standpoint in which objectives and relational capital, defined as trust plus cooperation (Porter, 1998), are connected to organizational outcomes.

2.1 Role and Scope of the Literature Review in this Thesis

As Light and Pillemer (1984) so eloquently postulate, all new knowledge acquired through research is linked to what was previously known. The literature review in this study serves to contextualize the research problem and questions in the organizational setting of CSM Tools, to see how research conducted by others can help to conscientize employees in the company that the integration of the goals of supply chain management and working capital is an important and essential feature in the achievement the shareholder-maximization objective of the firm. One feature of action research is to reflect on what has been known in order to synthesize the most salient features in an effort to improve the organization's processes Ivankova (2015). This study employs an integrative literature review to analyze and synthesize the importance of viewing and executing supply chain and working capital management policies as an interdependent structure to help the firm achieve greater efficiency. As Torraco (2016) points out, an integrative literature review takes a broad look at the subject being researched so that new frameworks, opportunities, and perspectives are developed.

The integrative literature review was particularly pertinent to this study due to the interdisciplinary and cross-functional nature of the issue being explored, and there was no single research output that specifically addressed the issue of goal interdependence in operations and financial management. Thus, the research could not be limited to business articles, but spanned research in supply chain and working capital management, organizational behavior, and human psychology, to get a profound understanding of how individuals interact socially as well as professionally in the execution of their daily business tasks. Much of the information on human behavior was generated through goal interdependence research incorporating teamwork (Deutsch, 1949; Lu and Tjosvold, 2013), which significantly affects not only how the integration of processes is achieved (Christopher, 2016), but is required for successful action research (Ivankova, 2015).

In the initial stages of the study, which could be termed the exploratory phase in which the researcher tried to find information that could help in the formulation of the research problem, that is, the relationship between supply chain and working capital management, the question that kept emerging was “why is it so challenging to integrate finance and operations management processes?” Hofmann and Kotzab (2010) recommend an examination of collaborative practices in business operations, while Antonacopoulou (2009) explains that goals drive behavior. As such, the idea of the interdependence of goals motivated the researcher to look closely at how goals are pursued and achieved. The literature research thus figured prominently in developing and guiding the research subject, looking at the inconsistencies that existed in the arguments of researchers, and what could be contributing to those inconsistencies, as well as demonstrating how the interdependence among functions could contribute to organizational efficiency. In accordance with Creswell (2017), the literature review served to present the results of past studies on the importance of linking the goals of supply chain and working capital management, to relate those studies to the current study, and to provide a framework in the form of goal interdependence theory to assess and amplify those results. Additionally, this being a mixed-methods study allowed the researcher to analyze and integrate findings from both qualitative and quantitative research aimed at achieving a broader understanding of the relationship between supply chain and working capital management.

The remainder of the chapter is as follows: goal interdependence theory, interdependencies in the supply chain, goals of supply chain management practices, goals of working capital theory, the intersection of working capital theory and supply chain management practices, the cash conversion cycle as a mediator, financial supply chain management, complementarity theory, influence of human decisions-making on organizational goals, and literature review summary.

2.2 Goal Interdependence Theory

This study utilizes goal interdependence theory to discuss the relationship between working capital and supply chain management, so a review of the theory is pertinent in the beginning. Unfortunately, no previous research has been done specifically on goal interdependence theory in supply chain and working management, or in finance and operations management. That this is the first study applying goal interdependence theory to these business disciplines adds to the originality of this project. However, the concept of goal interdependence has been used in general business discourse, organizational theory, and dynamic capabilities (Ferris et al., 2015; Lu and Tjosvold, 2013). In fact, much of the research in goal interdependence is heavily skewed towards Chinese businesses (Ferris et al., 2015). On the other hand, separate research on organizational goals and interdependence is prevalent in finance and supply chain management, particularly in the form of integration (Christopher, 2016). As such, I tried to meld both strands of research in to synthesize and exploit goal interdependence theory in this study. But the primary authority on goal interdependence referred to in this study is the seminal work of Deutsch (1949).

Goals are set to guide companies in achieving specific organizational objectives such as the maximization of shareholder value purported by business firms, and very important as well to achieve consistency in behavior. As Deutsch (1949) argues, goals serve a dual purpose. to show what the organization is, as outlined in its mission, and what the organization intends to become as expressed in its vision. Goals are also set to maintain an equilibrium between the wishes of the organization and those of the people who work for the company. How those goals are interrelated depends largely on the perceptions of individuals as to how their goals are aligned with those of the organization. This is the quintessence of goal interdependence, as Deutsch (1949) postulates.

Deutsch (1949), and reiterated by Lu and Tjosvold (2013), notes that without a true understanding of the need to interrelate and align goals, sections and processes of the business will erode because the bottom-line objectives of the company become more elusive. It is not sufficient for management to give speeches believing that they are promoting interdependence. The authors agree that for a team to be successful, every team member should perform at the expected levels set by the organization. They posit that human actions are a pervasive factor in how teams and goals are formulated and attained. For this to be achieved, everyone, not only management, should continually monitor the performance of all team members, and it should be emphasized that everyone wins when the entire organization wins. The interdependence of goals develops a collaborative value for the organization in that all parties builds a sense of competitive community and cooperation that the modern workplace is trying to institutionalize (Lu and Tjosvold, 2013).

Deutsch (1949), and later Lu and Tjosvold (2013) argue that goals can be pursued dependently, independently, or interdependently, but each depends on the culture of the organization, established procedures, and the personalities of the individuals. If groups work dependently, they expect that their goals are positively correlated, and each group has to perform in a way that will enhance the performance of everyone. If groups work independently, they believe that their goals are negatively correlated, and each party needs to perform in a way that provides the satisfaction needed to continue working. While Lu and Tjosvold (2013) agree with the definition of independent goal pursuit, they argue that it has negative implications for the overall organization because it encourages inefficiency. When the group works interdependently, each member understands that his or her actions directly impact the outcomes of the entire organization.

Deutsch (1949) and Lu and Tjosvold (2013) explain that apart from the dependence, independence, and interdependence variations posed above, goal interdependence can be pursued cooperatively or competitively. Cooperative goal interdependence suggests that the goals of individual A are positively related to the goals of individual B, and as individual A makes progress individual B also makes progress. That is, both sets of goals move in the same direction. This is equivalent to the arguments made by supply chain and working capital researchers (Hofmann and Kotzab, 2010) where the level of working capital positively correlates with the level of supply chain efficiency, and vice versa. On the other hand, competitive goal interdependence reflects goals that are negatively related. As individual A tries to achieve his or her goals, those of individual B are derailed. The liquidity/profitability argumentation put forward by working capital researchers (Gill and Biger, 2013) is that by improving liquidity, the firm reduces profitability. However, Wetzel and Hofmann (2019), and Gill and Biger (2013) argue that the firm should try to find a compromise between the two competing processes where an optimal level of liquidity and profitability is maintained.

Goal interdependence theory also shows that individuals can experience relationship conflicts because they may perceive incompatibility among their goals, those of the team, and those of the organization. Lu and Tjosvold (2013) state that conflicts not only cause isolation of some individuals even within the team, thereby breeding unhappiness, but they also negatively impact the number of goals and the level of productivity achieved. and indifference of individuals ostracism among individuals and ultimately be ostracized.

The authors agree that when this happens, management needs to cultivate a more collaborative culture through deliberate participation by examining the causes of dissension, and pointing out how interdependence improves relationships, increases trust, reduces risks, and elevates the level of success. Thompson (1967) believes that organizations allow their systems to disintegrate into a condition of pooled interdependence, where processes can be performed by independently by parts of the organization, even though their separate performances contribute to the overall success of the organization. However, Lu and Tjosvold (2013) highlight situations where independent performance result in overall low achievement of those organizations.

They agree with Deutsch's (1949) decision that interdependent goal achievement is the most efficient because it brings various groups together at the same time, similar to the philosophy of concurrent engineering (Toon et al., 2016), a process practiced by operations practitioners, bringing together all parties in a project to collaborate and share information continuously throughout the project. But Wu et al. (2015) argue that finding compatibility within the team is one of the most important antecedents of goal achievement because some individuals do not feel the urge to cooperate even if the goals are interdependent, Hence, goal interdependence is dependent on the constant effort by team leaders to seek commitment from their members. However, Spyropoulou et al. (2018) contend that although it is important to help individuals to overcome their workplace fears of integration, self-efficacy, which encourages individual motivation, is note significant in the achievement of goals. According to Wu et al. (2015), and Deutsch (1949), self-efficacy does not preclude external stimuli, so managers should seek to reinforce positivity in the organization, possibly through reward structures.

Drawing on the theory of equifinality (Kruglanski et al., 2013), there are several paths to the attainment of goals, and one individual may induce other individuals to find ways of accomplishing goals. Deutsch (1949) argues that an understanding of mutual goal fulfilment encourages intra-firm interaction, which is fitting for the achievement of value creation, because of synergic capabilities within the firm (Rappaport, 1986). Deutsch (1949) argues that it is important to understand how team goals and individual goals can be merged or associated to reach higher organizational performance.

In a study of supply chain firms in the United States, Allred et al. (2011) point out that high-level management officials have expressed interest in helping their employees in various departments to work towards the achievement of greater customer service. However, these officials have not been able to achieve that objective because they have not made it an organizational objective. As Kruglanski et al. (2013) note, goals are co-creatively achieved especially in nimble organizations, such as within a supply chain, and CSM Tools is in this category, that demands a co-creating structure.

2.3 Interdependencies in the Supply Chain

A supply chain has been defined as a network of interconnected individuals, activities, and resources all working together to transform inputs into outputs for the benefit of all parties involved. The idea of networking should not be regarded solely as an inter-firm relationship, but intra-firm activities and processes are a crucial step or antecedent to building relationships with other parties in the supply chain. Kembro and Selviaridis (2015) argue that the interrelationship of productive activities within a focal firm are even more important than forging external relationships because the focal firm needs to understand its direction and purpose within the chain before it can attempt to satisfy the needs and demands of the entire supply chain. They further argue that all relationships within the organization have direct and indirect implications for the broader supply chain.

They draw on Thompson's (1967) interdependence theory to explain the internal workings and interdependencies of supply chain practices. Thompson (1967) taxonomizes interdependence theory into three categories: pooled, serial, and reciprocal interdependence.

1. pooled interdependence refers to two activities that are not directly linked, but whose outcomes are ultimately connected to complete a process or accomplish a certain goal.
2. serial interdependence refers a direct connection between processes, and the input of one process is dependent on the output of the other process.
3. reciprocal interdependence refers to the mutual exchange of inputs and outputs, and the actions of one unit is contingent upon the actions of the other unit (Thompson, 1967, p. 55).

Thompson (1967) notes that communication and collaboration become key as the organization moves from pooled to serial to reciprocal interdependence, and it is very important for management to ensure that departments are willing to engage socially since acting otherwise could prove costly for the organization in terms of wasted resources, and lost value co-creation. As mentioned in the introduction, the lack of communication between finance and operations management at CSM Tools during the financial crisis, resulted in lost revenues and company downsizing. All three interdependencies proffered by Thompson (1967), seemed to have been ignored during that period. According to Thompson (1967) and echoed by Jadhav, Orr, and Malik (2019), all three types of interdependence are especially critical in moments of business uncertainty which can be argued as ever-present. It has been variously discussed that business operates under conditions of uncertainty.

Jadhav, Orr, and Malik (2019), and Thornton, Esper, and Autry (2016) state that the success of the supply chain largely depends on the belief of everyone in the organization that their activities and processes are sequentially interdependent, and that they should attempt at all times to see how they can bring those activities in parallel form. That is, by communicating and collaborating on a regular basis, the activities can be completed efficiently, with minimal time wasted.

Jadhav, Orr, and Malik (2019) posit that as firms pursue interdependence in their individuals business processes and within the supply chain as a whole, they will be better equipped to understand and mitigate chain interruptions, possibly by knowing in advance, when chain members are experiencing operational problems. For example, when activities are taking a long time to complete, and are not noticed by everyone, interdependence theory postulates that a tight communication channel will disseminate the information quickly so that corrective actions are taken in time (Mentzer, 2001).

Supply chain interdependence aims to improve competitiveness by integrating internal functions within a company (e.g., different departments within the company) and establishing effective links with suppliers' external operations and customers (Kim, 2009). Christopher (2016) argues that supply chain orientation, which is the recognition by the firm of the skills, decisions, and actions required to manage the supply chain, is better understood within the context of making everyone in the organization aware of the responsibilities they have towards ensuring the success, not only of the organization, but of the entire chain. Thornton, Esper, and Autry (2016) refers to this as collective responsibility that tends to strengthen not only internal resources, but generates various equities for the firm in both upstream and downstream relationships. Many authors (Zhao and Huchzermeier, 2019; Christopher, 2016; Flynn, Huo, and Zhao, 2010) seem to agree that supply chain integration has been an elusive concept for a long time, and that it would be more worthwhile to promote interdependence within the supply chain to alert individuals and firms of the interrelatedness of their responsibilities to the ultimate goals of their organizations and the overall supply chain.

Wong, Tjosvold, and Zhang (2005) and Thornton, Esper, and Autry (2016) express similar views that a recognition of the interdependence among internal business processes, and among supply chain partners, especially in the distribution of goods and services, helps each member to achieve goals in a cooperative manner that results in the sustainability of companies. For instance, collaboration and mutual dependence among companies helps to facilitate and accelerate the objective of continuous improvement that supports the sustainability endeavors of each organization. On the other hand, both sets of authors observe that some companies are hesitant to share information which is a requirement for supply chain interdependence. This hesitance is also noticed within the company. However, the authors also note that as customer expectations and demands increase, savvy companies are finding ways to share information without divulging too much that will reduce the competitive capacities of the firm. (Christopher, 2016) argues that trust in the relationship comes from relationships that the companies see are helping their growth prospects.

This trust should also be an abiding philosophy in the interactions and communications among parties in the same organization, a principle that Christopher (2016) believes comes from the building of a collaborative culture, and orientation towards cooperative goal achievement. In fact, this is the principle that undergirds Deutsch's (1949) goal interdependence construct. Essentially, therefore, individuals, teams, and organizations should realize that in order to achieve their goals, they need to understand the dynamics of boundary spanning (Porter, 1998) that will provide an easy circumvention of problems that might occur within the supply chain. Lu and Tjosvold (2013) postulate that organizations within a supply chain cannot function as if their goals were independent. In fact, in their investigation of manufacturing firms in the aftermath of the financial crisis, Baños-Caballero, García-Teruel, and Martínez-Solano (2014) find that many firms were operating independently of one another, and they became casualties of the moment. Independent actions tend to obscure the path towards goal achievement as communication is made difficult by some stakeholders, leading to low productivity and efficiency. Porter (1998) notes that translating actions into outcomes without understanding how those actions and outcomes are related to others is a recipe for inefficiency.

Based on the literature, the discourse on interdependence in organizations seems to revolve around the pursuit and achievement of goals, whether team, functional, or individual. CSM Tools is a significant distributor in the metalworking and maintenance, repair, and operations (MRO) products and services industry, so it is important to review current literature on the goals of the two main functions under study, supply chain and working capital management. We will first examine the goals of supply chain management, then those of working capital.

2.4 Goals of Supply Chain Management Practices

According to Christopher (2016), the goals of supply chain management practices could be summarized in three phrases: the satisfaction of consumer demands, the determination of cost-cutting activities, and the convergence of those activities. Satisfied consumers have become the staple of sustainability, around which the organization needs to plan goals of those activities that should be integrated in order to reduce cycle times. It is for these reasons that Christopher's (2016) view is in direct relation with that of Cao et al. (2019) who posit that supply chain management practices should revolve around a meta-managerial framework that combines the internal capabilities of the firm with the opportunities in the business environment in order to develop composite capabilities to be able to not only create value for customers, but to confront any environmental threats that may prevent that co-creation of value. The linking of both upstream and downstream activities is one of the main goals of supply chain management practices, because supplier-oriented and customer-oriented activities have to be combined to meet the value-creating goal of the firm (Christopher, 2016).

Christopher (2016), and Gattorna (2006) point out that coordination and collaboration are quintessential in transforming supply chain management from a mere coordination function to a comprehensive strategic and competitive weapon to help the firm to maximize the returns that shareholders and other stakeholders seek. Much of the extant literature shows the supply chain as the linchpin of the organization (Christopher, 2016; Esfahbodi, Zhang, and Watson (2016; Rungtusanatham et al., 2003). Christopher (2016) explains that the supply chain originated as the movement of goods, and that this definition has continued to the present. And even though the delivery of services has become a major part of the supply chain many have still held on to the original definition. At CSM Tools, for instance, individuals perceive the goal of supply chain management as a system to ensure that customers receive their orders on time, a very narrow view of the complexities involved in the formulation and execution of supply chain practices (Christopher, 2016).

Li et al. (2006) argue that supply chain management practices include proper inventory and distribution management, the essence of the mission of my organization, reverse logistics (the management of merchandise returns), partnership between the focal firm and its suppliers, supply chain integration, both internal and external, customer relationship development, and information sharing. Christopher (2016), and Chen, Daugherty, and Roath (2009) add that one of the goals of supply chain management should be to secure enough financial resources to move the supply of goods along the chain. Esfahbodi, Zhang, and Watson (2016) explain that no longer is the management of the supply chain limited to operations management specialists, but should be the concern of all departments in the firm. This is a very heartening observation and development because several researchers (Christopher, 2016; Blome, Schoenherr, and Rexhausen, 2013; Hofmann and Kotzab, 2010) have advocated for a more expansive role for supply chain management, and for more managerial involvement in managing that role. The complex dimensions of the modern supply chain, with its international connections (Hofmann et al., 2011) warrant a wider and pragmatic monitoring lens.

As Thornton, Esper, and Autry (2016)) note, pragmatism sometimes is absent from supply chain implementation strategies, causing a minimization of the true role of supply chain management, and, thereby missing, according to Soares et al. (2017), the total quality management goals of supply chain management. That is an accentuation of continuous improvement, customer demands, strong relationships with suppliers and customers, and a collective problem-solving functionality, all of which could be subsumed under the goal- interdependence philosophy (Rauch, 1949) to be examined later.

2.5 The Goals of Working Capital Theory

The primary goal of working capital management, defined as the difference between a firm's current assets and its current liabilities, is to maintain sufficient cash flow to satisfy short-term obligations and daily operating costs (Hofmann et al., 2011). By achieving this level of cash flow, the firm is effectively establishing a balance between risk and profitability that should ultimately contribute positively to the firm's value. Aktas, Croci, and Petmezas (2015), and Baños-Caballero, García-Teruel, and Martínez-Solano (2014) argue that the management of working capital is one of the most important components of the firm's capital structure even though it is accepted in theory but not so much in practice, where it is secondary to capital budgeting, the process undertaken by a firm to evaluate and select major long-term investments that are consistent with the firm's goal of shareholder value maximization (Hofmann et al., 2011). Aktas, Croci, and Petmezas (2015) however contend that if managed correctly, working capital is found to significantly impact the achievement of the firm's shareholder value maximization objective because working capital is closely tied to liquidity, and as liquidity decreases, the value of the firm decreases, since the firm then needs to borrow funds to maintain its operations. Gill and Biger (2013) theorize that firms that underemphasize short-term policies underperform in the long-run. The authors further argue that being heavily leveraged contributes a reduction in value.

The research by Aktas, Croci, and Petmezas (2015), and Gill and Biger (2013), make up a very small sample of significant investigation the Anglo Saxon world. An internet search of the importance of working capital management to the firm confirms that most of the research is from developing countries. Why is this? Schiller (2008) believes that this is strategic. Working capital management is a very significant concern for emerging markets because they have less access to financial resources than do developed markets. Deloof (2003), and Shin and Soenen (1998) point out that even though it has been found that an improvement in working capital management is directly related to an improvement in a firm's profitability measured by return on assets or return on equity, many managers tend to disregard this fact, and generalize the improvement in profitability of the firm to improvements in capital investments.

Wetzel and Hofmann (2019), Baños-Caballero, García-Teruel, and Martínez-Solano (2014), and Hofmann and Kotzab (2010) postulate that the financial health and operational success of a company depends, to a considerable extent, on a sound working capital management policy. Gill and Biger (2013) note that prior to the financial crisis, working capital management was merely concerned with the management of accounts receivable and accounts payable, and most people used the current ratio (current assets/current liabilities) as the gauge for how well companies were doing, as long as the barometer of 2:1 was achieved. That is, that current assets were two times current liabilities. However, Wetzel and Hofmann (2019) find that individuals still believe that adequate working capital is indicated by a 2:1 current ratio. Using this measure alone underscores the scant attention that companies pay to working capital management, which is much more involved and complicated if it is taken seriously.

Hofmann and Kotzab (2010) and Richards and Laughlin (1980) argue that the current ratio is a static measure that is a benchmark to compare liquidity across firms, but it underestimates the true objective of working capital management as a variable that is a significant part of the cash management policy to ensure the smooth operations of the company.

The goal of working capital management boils down to two central strategies: the conservative and aggressive strategies (Baños-Caballero, García-Teruel, and Martínez-Solano, 2014). The conservative approach uses long-term capital to finance all permanent assets. In this way, the firm hedges against risk by holding large inventories, low payables, and an adequate amount of funds in bank accounts (Frankel, Levy, and Shalev, 2017). The aggressive approach uses short-term funds to finance operations, and tries to manage with minimal investment in inventory, accounts receivable, and cash for a certain level of activity or sales. An aggressive policy could increase profitability since less cash is committed to current assets. On the other hand, it could increase operating risk because the firm could lose sales because of inventory shortages (Hill, Kelly, and Highfield, 2010). The authors argue that this approach is used by several organizations in manufacturing, and this is the approach that CSM Tools adopts. The objectives of both approaches, as highlighted by Wetzel and Hofmann (2019), and Baños-Caballero, García-Teruel, and Martínez-Solano (2014), are aimed at operational efficiency, striking a balance between liquidity and profitability (Mushtaq et al., 2015; Eljelly, 2004), and moderating the risk-tolerance level of the organization (Wetzel and Hofmann, 2019).

Companies seem to lack a formal working capital management policy, and mainly treat the function as an ad hoc principle. In a survey of nearly manufacturing firms, Hofmann et al. (2011) find that approximately 30% have a formal working capital policy, and approximately 60% have an informal working capital policy, while nearly all have a formal capital budgeting policy. Capital budgeting is the planning and management of the organization's long-term investments (Brigham and Daves, 2016), and research finds that most finance departments expend most of their financial resources on investing, while ignoring the operating, or working capital side of the capital structure (Mushtaq et al., 2015), a problem that was played out during the financial crisis.

On the other hand, it has been found that a concentration on capital budgeting issues has had its share of problems underpinned by human errors in judgment. In a case study and Monte Carlo Simulation of financial decisions in manufacturing and service firms, Kerler, Fleming, and Allport (2014) find that there is too much reliance on formulas such as the discounted cash flow and the internal rate of returns, and not much emphasis on the goals of those decisions. As such, the researchers find that there is a lack of consistency and convergence of objectives, similar to the decisions made in working capital management. Hence, the authors conclude that a lack of stated purpose of the decisions makes for a carelessly formulated financial planning and analysis scheme. Aktas, Croci, and Petmezas (2015) note that the goals of working capital have a precedence relationship with capital budgeting, but Mushtaq et al. (2015) counter by arguing that the goals of working capital and capital budgeting are aimed at investing in corporate strength, and that the short and long-term viability of the firm depends on strengthening both sets of policies.

The impact of working capital on the survival of firms was magnified as several financial firms such as Bear Sterns, JP Morgan, Fannie Mae, Lehman Brothers, and Washington Mutual Bank collapsed, and several manufacturing firms such as General Motors and Chrysler saw their supply chains weakened and had to be bailed out by the government in the aftermath of the financial crisis as they lacked sufficient liquidity.

The United States Congress believed that undercapitalization caused that systemic event, and enacted the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010, commonly referred to as Dodd–Frank, to force companies to take a closer and more careful look at their short-term financial protection. Bernanke (2018) highlights the myriad setbacks suffered by the manufacturing industry in particular, as well as wholesalers and retailers, as their performance was undercut by depleted working capital and credit rationing. Baños-Caballero, García-Teruel, and

Martínez-Solano (2014) studied a sample of non-financial firms in the United Kingdom and extrapolated to findings to other territories as the financial crisis had global implications. They found a positive relationship between the amount of working capital the firm holds and its ability to survive.

Aktas, Croci, and Petmezas (2015) argue that working capital is synonymous with cash flow, which is the amount of money collected and paid out by the organization (Baños-Caballero, García-Teruel, and Martínez-Solano, 2014; Lough, 1917), but all these researchers further argue that the perception of cash flow as simply intake and outflow of money in the firm does not adequately explain the sophistication, importance, and intricacies of working capital management. That working capital is limited to the operating activities of the firm could be one of the reasons it has been overlooked (Aktas, Croci, and Petmezas, 2015). CSM Tools is no exception to this unsophisticated view of working capital management, with the 2:1 current ratio benchmark for an adequate level of assets versus liabilities. However, Kieschnick, Laplante, and Moussawi (2013) and Deloof (2003) argue that the formulaic rule of a 2 to 1 ratio has been judged misused by many firms, and provide a false satisfaction, because there are deeper levels to achieving an adequate level of working capital.

The authors believe that size of the firm, credit policies, outlook on risk and profit margins, and the availability of credit impact the amount of working capital available to the firm. Gill and Biger (2013) believe that the risk of suppliers and other customers going bankrupt is not adequately discussed in the literature, and how to manage that in relation to working capital. At the same time, however, they do not provide any concrete suggestions as to how to deal with the issue. They suggest that monitoring of the components of working capital, especially accounts payable and accounts receivable, is important to maintain an optimal level of working capital, which the authors claim is a challenging exercise.

Deloof (2003) posits that cash flow management is actually the movements between accounts payable and accounts receivable. If the two accounts are not coordinated, added pressure will be placed on the company to fund the disparity, and open the firm to operating risks. The optimal tactic is to lengthen the payment period to suppliers, and shorten the collection period for debtors, and the goals of both accounts receivable and accounts payable are complementary in ensuring that the business remains a going concern (Gill and Biger, 2013).

The firm can manipulate payment terms it has with its customers. For example, CSM Tools uses a 2/10, net 30 payment policy, meaning that customers are allowed to take a 2% discount of the invoice if they pay in 10 days; otherwise, they will need to pay the full invoice amount within 30 days. This is the metaphoric application of Darwin's theory of the survival. According to Dekker, Ding, and Groot (2016), organizations will act independently or interdependently based on the directions in which their bottom lines seem to be proceeding. Of course, shortening the payment period could have negative consequences for customer relationship management (Dekker, Ding, and Groot, 2016) because other customers are trying to implement competitive strategies to survive, and the demands of the focal firm could derail those efforts. Deloof (2003) notes, however, that as firms act in their own best interests, they may be engaged in a zero-sum game.

Gill and Biger (2013) emphasize three ways to manage working capital: precautionary, speculative, and transactional motives. The precautionary motive safeguards the company against unforeseen events. It also acts as a shelter against the risk of default by the firm's customers. The speculative motive holds cash to take advantage of opportunities in the marketplace, and the transactional motive sets cash aside for the day-to-day operations of the firm. The authors explain that such policies are normally executed by experienced financial managers who understand and monitor the business environment. This could signify, as this research serves to show, that finance should not be concerned only with seeking funding for organizational projects, but should be responsible, at the same time, for monitoring the marketplace to be able to inform others who may not be as discerning.

Deloof (2003) found significant negative relationships among, average collection period, inventories, and accounts payable as firms compete to find a satisfactory level of working capital formulas that could help them attain their firms' financial objective. The author asserts that the role and goal of working capital are sometimes complicated and overshadowed by other variables that may not be conducive to liquidity and profitability. Could that have been the reason for the downfall of various companies to which the literature allude? Garcia-Appendini and Monotoriol-Garriga (2013) seem to believe so, arguing that a defined working capital policy is required so that everyone in financial decision-making positions can contribute to its success. In fact, the research consistently shows that working capital is statistically significant, certainly to varying degrees, to profitability.

The liquidity-profitability dichotomy sometimes discussed in relation to working capital is largely an academic exercise because in practice, both terms seem to be used interchangeably, except by financially-savvy individuals. In fact, Hofmann et al. (2011) seem to get the idea. They argue that the goal of working capital as a measure of liquidity solely is a counterintuitive discussion because the absence of liquidity could be harbinger of organizational failure. This could be true as anecdotally, Garcia-Appendini and Monotoriol-Garriga (2013) point out that many small to medium sized companies that show illiquidity often file for bankruptcy shortly after, especially in cases where they do not have adequate access to loans.

It is for these reasons that this study, in accordance with the advice of Wetzel and Hofmann (2019), has argued that financial management should not be the only function monitor working capital, but operations should also play a complementary role in ensuring an optimal level of working capital (Hofmann and Kotzab, 2010).

2.6 The Intersection of Working Capital Theory and Supply Chain Practices

Now that the research context has been established, and the importance of working capital theory (WCT) and supply chain management practices (SCMP) has been outlined, attention now turns to an analysis and synthesis of some of the extant research that shows the relationship between the two functions relative to the goals of the firm.

According to Porter (1998), management decisions aimed at maximizing the role of one function over another, treating them as if they were substitutes rather than complements, may achieve suboptimal performance for the company. Supply chain management research has amplified this view, pointing out that individual firm behavior tends to jeopardize the strength of the other organizations, and that collaboration leads to enhanced performance, thereby creating competitive advantage for all firms (Christopher, 2016). From this perspective, the performance of the supply chain requires a constant flow of funds, and working capital represents that current stream of funds (Zhao and Huchzermeier, 2019; Hofmann and Kotzab, 2010). These researchers have conducted studies in the services and manufacturing industries, and have found that that the management of working capital directly influences the operation of supply chains.

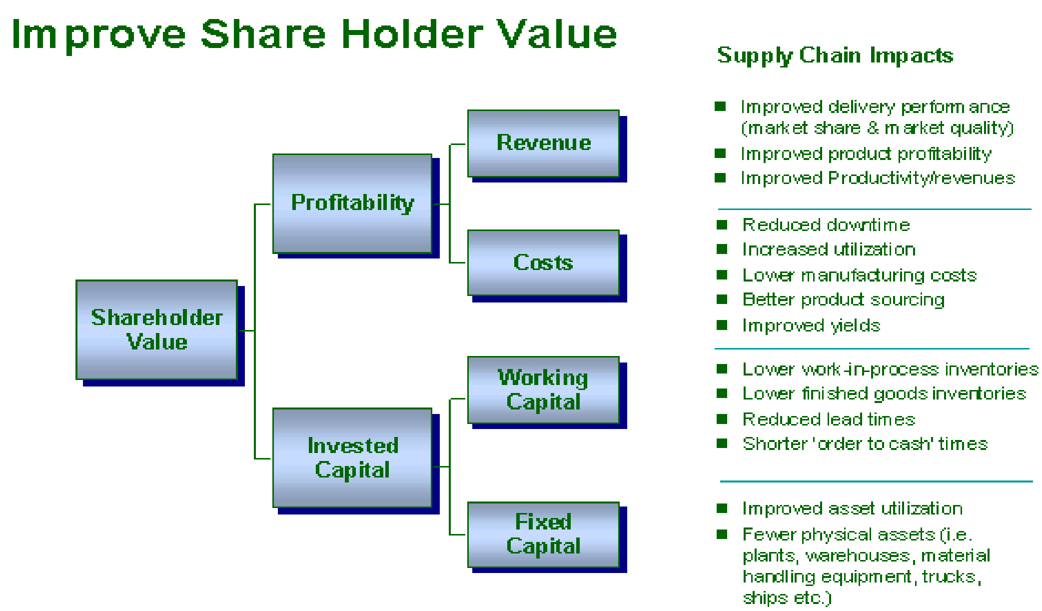

Figure 4 Shareholder Value and Supply Chain, Pinches (1994), p. 498.

As depicted in figure 4, the outcomes of supply chain practices are impacted by financial policy decisions, with both aiming to reduce costs and to generate revenue for the firm. It is shown that adequate working capital leads to reduced lead times, which in the context of CSM Tools is the time it takes from the customer places the order to when the order is released considering all conditions are satisfied, to when the customer receives the order. A limitation of working capital could cause even the item ordered by the customer to be out of stock. Aktas, Croci and Petmezas (2015) argue that adequate working capital is used to ensure that the inventory of the most ordered products is always available, not necessarily in an over-supply, considering that it is costly to keep excess inventory. Adequate amounts of inventory is required to reduce lead times. The reduction of lead times enhances customer relationships and builds customer equity (Chaudhuri, Boer, and Taran, 2018), all contributing to increased value, which is one of the main objectives of the organization. From this perspective, there is a convergence of working capital and supply chain goals to help the firm achieve its objectives.

Peng and Zhou (2019) note that there is a paucity of literature that addresses the goal interdependence of working capital and supply chain management. Most of the literature focuses on the use of the cash conversion cycle as a way of determining how certain variables such as days inventory outstanding, days sales outstanding, and days payables outstanding, affect the inflow and outflow of cash in the focal organization (Hofmann and Kotzab, 2010; Timme and Williams-Timme, 2000; Richards and Laughlin, 1980). But the goals are inferred rather than used to show how the functions contribute to goal of organizational and functional efficiencies. Zhao and Huchzermeier, 2019; Protopappa-Sieke and Seifert, 2010) demonstrate that proper financial management, with particular emphasis on WCT, is significant to achieve efficient supply chain operations. That is, without working capital, the upstream and downstream activities are interrupted (Wetzel and Hofmann, 2019; Hofmann and Kotzab, 2010; Protopappa-Sieke and Seifert, 2010).

Wetzel and Hofmann (2019) state that organizations should strive for an integrative process between supply chain policies and trade credit policies as these two activities have significant impacts on the efficient level of working capital. Credit policies such as payment terms outlined earlier, unleash, or tie up cash for operations, and could help the firm achieve or miss its financial performance objectives. When a credit policy is based on the conditions of the business environment rather than on historical precedence, it is more beneficial for all the firms involved in the transaction (Wetzel and Hofmann, 2019). That suggests that firms should allow for fluidity in their credit policies contingent on external economic dictates (Zhao and Huchzermeier, 2019). In Bernanke (2018) attributes the failures during the financial crisis to inflexible credit policies and faulty monitoring of those policies that were out of line with the current economic conditions at the time. Chod, Rudi, and Van Mieghem, (2010) argue that credit policy and working capital initiatives represent an investment in the supply chain whose goal is expected to yield returns to grow that investment, helping the firm to achieve shareholder value maximization.

The maximization of value has to involve other key business activities. Hofmann et al. (2011) postulate that the maximization of shareholder value has to involve other key business activities, such as supply and operations planning (S&OP). S&OP relates customer demand with supply chain capabilities through marketing, production, procurement, and financing. Choy et al. (2012) finds that companies that integrate their forecasting and supply chain planning schemes outperform the competition in terms of performance efficiency because they are able to execute their just-in-time (JIT) policies to satisfy their customers in a timely fashion. The JIT principle is very demanding because transparency and constant communication are necessary for it to be successful. At a time when companies face fluctuating demands and uncertain economic conditions, it is prudent that close departmental alignment exists between finance and the supply chain particularly to ensure that an adequate level of working capital is available to service the channel functions (Choy et al., 2012). The matching of the supply with customer demands has become a technique to strengthen cash flow (Choy et al., 2012).

Wetzel and Hofmann (2019) point out that firms that are able to explain the interrelationships between their working capital adequacy and movements in their supply chains have proved to be more successful. Shin and Soenen (1998) express the view that managers need to understand the impact of financial decisions on the value of the firm, and how working capital policies contribute to that value. Any increase in accounts receivable inventories lowers cash inflow, and conversely, a decrease in accounts receivable and inventories increases cash inflow. Hence, there is an inverse relationship between AR and inventory and cash inflow (Hofmann and Kotzab, 2010). On the other hand, a decrease in accounts payable decreases cash, meaning that the firm uses cash to pay its suppliers. If accounts payable increases, it means that the firm has received additional credit from its suppliers, and therefore, the firm saves cash that can be used in supply chain activities. Accounts receivable and accounts payable should be coordinated because they impact inventory (Tan et al., 2017). What this suggests is that firms, such as CSM Tools that have different individuals overseeing accounts receivable and accounts payable should make sure that there is coordination in terms of outflow and inflow of capital. If suppliers are not paid, inventory can be delayed, and the entire supply chain is in peril. And the supply chain is also imperiled if funds are not collected. CSM Tools, for instance, puts a hold on customer orders if payments are not received, and the decision sometimes jeopardizes customer relationships, slowing down the supply chain process.

Inventory management itself can be viewed as a connecting thread among all these working capital variables. Bowersox et al. (2013) argue that by managing inventory, and especially inventory costs, the firm is managing its accounts payable, accounts receivable, and the overall supply chain. Especially in the case of CSM Tools, which is a distribution channel, average inventory over the 10 years studied for the company was approximately $407 million, which was approximately 45% of average total current assets.

CSM Tools employs an ABC inventory classification system, as opposed to the economic order quantity (EOQ) system that many of its competitors use. Simply put, the EOQ principle places more emphasis on the reduction of inventory costs, especially inventory setup and holding costs by ordering the correct amount of inventory so that the company does not need to hold inventory for too long before it can be sold. The ABC system categorizes inventory based on the amount of revenue the items generate. This system of classification is patterned on the 80/20 Rule which states that 80% of the company's annual inventory expenditures are accounted for by 20% of the items in total inventory. Big-ticket items are in the A category which is closely monitored and regularly inventoried. The other items are distributed between B and C according to dollar value. Wisner, Tan, and Leong (2014) point out that when the company sells expensive items from its inventory, it is amassing large amounts of accounts receivable that is expected to become part of the working capital stream, and if payments are not received the supply chain is hampered. An integrated supply chain is dependent on the flow of funds more than on the flow of information that is highly stressed in the literature (Wetzel and Hofmann, 2019).

In fact, it has been established that supply chain management connects the triadic elements of products, information, and finance to strengthen corporate performance. Wetzel and Hofmann (2019) argue that firms need to develop frameworks that aggregate business performance and profitability metrics across finance and the supply chain to show the importance of the movement of funds within the supply chain. They suggest that the cash conversion cycle (CCC) is a good point of convergence for key financial metrics and corporate value.

2.7 The Cash Conversion Cycle Mediates WCT and SCMP

The cash conversion cycle (CCC), the seminal work of Richards and Laughlin (1980), is the primary metric that ties together the balance sheet current-operations variables of inventory, accounts receivable, and accounts payable. From a financial perspective, the authors show that the firm should look closely at the number of days funds are tied up in working capital. In this case, the movement of inventory is crucial as it represents the level of efficiency in production, and in the case of non-manufacturing firms, it indicates how efficient the firms are in the management of the demand-supply scheme of the supply chain (Wetzel and Hofmann, 2019; Hofmann and Kotzab, 2010). Accounts receivable represents the downstream supply chain management, the relationship between the focal firm and its customers as both parties try to enhance their liquidity positions, and to keep their operations functioning. Accounts payable measures the efficiency in the management of upstream supply chain activities, in an opposite way to the management of accounts receivable, but with the same intent of keeping the supply chain viable.

Zeidan and Shapir (2017) describe the CCC as representative of much of what working capital aims to do. Hofmann and Kotzab (2010) believes that the CCC tells a partial story of working capital management because working capital management is a complex metric whose true value should take in variables such as firm size, industry, and payment history of customers. Aminu and Zainudin (2015) also believes that that the CCC is a complex metric whose value is seen as a more substantive analysis of the organization's daily workings beyond the finance department.

The CCC gives management an idea of how to boost cash flow by moving beyond the static financial metrics such as current ratio, the quick ratio [(current assets – inventories)/current liabilities], and working capital figures (Zhao and Huchzermeier, 2019; Zhu and Hofmann et al., 2011; Richards and Laughlin, 1980). The quick ratio is inadequate in monitoring working capital because it merely looks at the ratio of current assets to current liabilities, thereby ignoring the operational activities of the firm, and the supply chain conditions (Zhao and Huchzermeier, 2019; Richards and Laughlin, 1980). It is for these reasons that other researchers, Aminu and Zainudin (2015), and Hofmann and Kotzab (2010), regard the CCC as a more realistic measure, and a mediator of financial and operations management performance.

The CCC (figure 5) is a composite metric that draws together days inventory outstanding (DIO), days sales outstanding (DSO), and days payable outstanding (DPO). It is computed as; DSO + DIO – DPO. DSO (Accounts receivable/Sales)*365) is length of time it takes credit sales to be converted into cash. DIO (Inventory/Cost of goods sold)*365) is the length of time required to convert inventory into sales. DPO (Accounts payable/Cost of goods sold)*365) is the average length of time it takes a firm to pay its invoices and other bills on trade credit. Trade credit policies allow a business a certain amount of time after receiving goods and services to pay them.

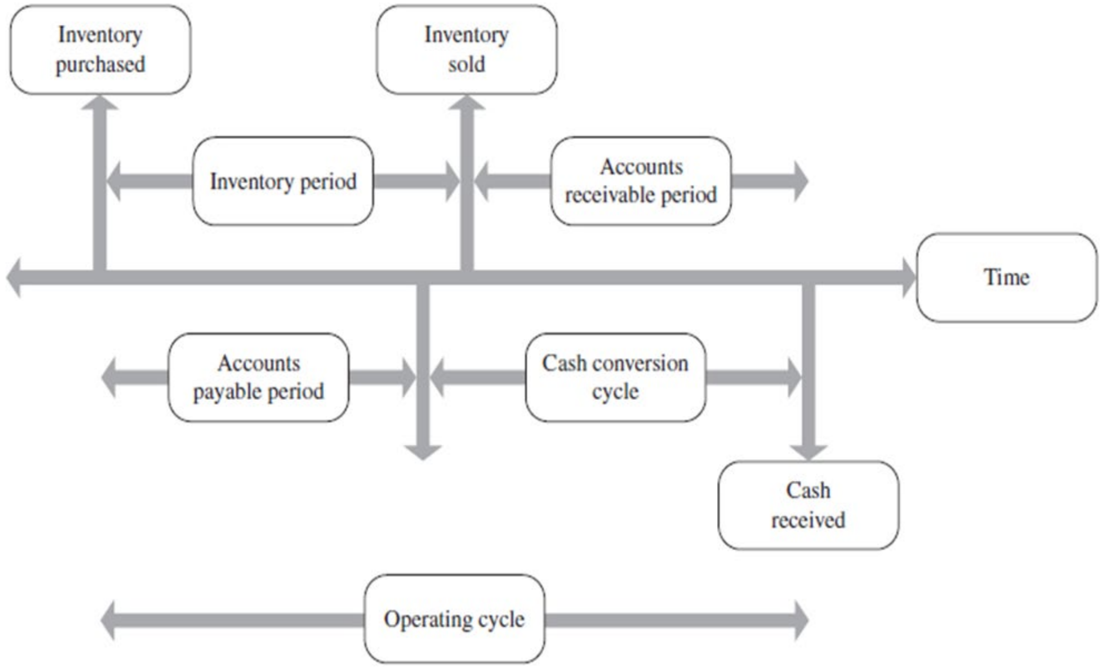

Figure 5 Cash Conversion Cycle--- Source: Ross, Westerfield, and Jordan (2016), p. 597.

From a more operationally utopian perspective, Zhao and Huchzermeier (2019) argue that working capital management should be studied in both operations and financial management. However, this might be a challenging request because, according to Raveendran (2020), Coughlan and Coghlan (2002), Bennis and O'Toole (2005), business education has been slow in adopting a cross-functional treatment of its business functions, and the obvious lines of demarcation among business functions are stymieing business performance.

The liquidity objective, the maintenance of credit, of the firm is inferred in the structuring of the CCC (Zeidan and Shapir, 2017; Farris and Hutchison, 2002; Richards and Laughlin, 1980). The firm can manipulate the flow of inventory and cash to ensure that it does not have to resort to expensive cost of capital to fund its operations. The firm can determine whether to pay suppliers quickly or to speed up the receipt of payments from customers.

Time and operational cycles connect the variables of the CCC because it is geared towards the achievement of efficiency within a short period of time. Efficiency is not only related to cost, but as Wisner, Tan, and Leong (2014) note, the time element in business is as important as time, because the longer it takes to accomplish a task, the more resources needed, and at a cost to complete it. In devising working capital and supply chain policies, the manipulation of the CCC variables is done to ensure the shortest possible time periods.

Eljelly (2004) to argue that the theoretical arguments surrounding the CCC may not come to fruition in practice because of economic uncertainties that could affect the way customers pay, the demand for inventory, and transportation delays. However, Baños-Caballero, García-Teruel, and Martínez-Solano (2014) point out that these situations are already baked into the conception of the CCC. For example, CSM Tools is vulnerable to shipment delays caused by snowstorms, and other natural events. When these events occur, customer returns increase, thereby depleting working capital, and reducing value for both customers and the firm.

Eljelly (2004) contends that deep-seated cash flow problems experienced by some firms can be attributed to inadequate understanding and management of the CCC.) Baños-Caballero, García-Teruel, and Martínez-Solano (2014) partly ascribe the failures of many non-financial institutions during the financial crisis to the possibility that some people ignored the warnings of lengthened CCC. This is assumption is validated by information I received from individuals at CSM tools, indicating that they did not pay careful attention to the continued increase in the accounts receivable caused by the fact that "customers were taking a long time to pay." Wetzel and Hofmann (2019) is correct in suggesting that the CCC should not be a finance department accounting but should be a primary monitoring tool in both finance and operations.

Large companies such as Dell Computers, Amazon, and Cisco include discussions of the CCC in their annual reports, as these companies focus attention on their goal of cash flow management to bolster their supply chains. Baños-Caballero, García-Teruel, and Martínez-Solano

(2014) claim that the CCC is particularly necessary in manufacturing, service, and retail/wholesale industries because of the close and interactive relationships that exist in these industries, and their reliance on rapid turnarounds in cash to maintain healthy financial positions. This is applicable to CSM Tools whose mission is rooted in the manufacturing sector. The authors also find that companies that emphasize an analysis of CCC components significantly improve their cash management efficiency.

Hofmann et al. (2011) note that the amount of working capital held by a company depends on that company's business model and goals. Dell requires suppliers to maintain inventory at a supplier hub, located adjacent to the assembly facility, so that assembly time for orders is shortened. Since suppliers own the inventory at the supplier hub, completed systems are shipped immediately, and the assembly process is fast and efficient. Dell maintains negligible inventories, and as such, the company is not subject to fluctuations in inventory costs that are positively related to the level of investment in working capital (Boisjoly, Conine, and McDonald, 2020).

Hofmann and Kotzab (2010), and Zhao and Huchzermeier (2019) suggest that the CCC components are important to corporate level executives when corporate financial performance, dividend policy, and overall shareholder value are affected. To ignore the link between the CCC and the overall financial flow is a signal of the suboptimization of the supply chain. As a result of the divergence in the literature regarding the connection between the CCC and other performance indicators of the firm, researchers have established the twin framework of financial supply chain management.

2.8 Financial Supply Chain Management Practices

While there has been widespread agreement on the collaborative action in the movement of goods and services in the supply chain, discussion on the movement of financial resources within the supply chain has been largely neglected, or left to financial management (Hofmann and

Kotbab, 2010). Supply chain goals seem supplementary rather than complementary to financial goals. Protopappa-Sieke and Seifert (2010) observe that in order to change this perspective, and bring finance, especially working capital to the forefront of organizational goals, researchers and some business managers of companies such as Intel and General Electric, began to speak about the financial goals of the supply chain (Wetzel and Hofmann (2019; Hoberg, Protopappa-Sieke, and Steinker, 2017; Protopappa-Sieke and Seifert, 2010), which has become to be formally known as financial supply chain management (FSCM).

FSCM represents the intersection between finance and operations (Wetzel and Hofmann, 2019), or more specifically, between working capital and supply chain management (Wuttke et al., 2016,), and is a valuable input to the strategic planning and implementation of working capital into the holistic view of the organization's supply chain decisions (Wuttke et al., 2016). In the literature FSCM has been categorized as either actor-based or practice-based (Wuttke et al., 2016,). Within the actor-based approach, FSCM involves a network of business managers work closely together to ensure that there are no glitches in the flow of funds within the supply chain. Within the practice-based view, each firm follows a set of financial procedures to plan, manage, control, and optimize the flow of cash within the supply chain. According to Wuttke et al. (2016), these approaches not only help managers to monitor the availability of working capital, but get other institutions, such as banks and other finance companies, involved in the supply chain activities. Houston, Lin, and Zhu (2016), Wuttke et al. (2016), and Flynn, Huo, and Zhao (2010) argue that FSCM represents the evolution of supply chain management as the central vehicle for transforming organizational capital into profitable outputs, thereby enhancing firm value.

Zhao and Huchzermeier (2019) note that researchers and practitioners want to know how best to maintain financial equilibrium in an organization so as to minimize financial interruptions in the supply chain. This direction is more in alignment with the purpose of this study to explore factors that impact the maintenance of that equilibrium. And according to Coughlan and Coghlan

(2002), any assessment of inter-firm or intra-firm supply chain integration or the balance operations and finance should include individuals from various sectors, both within and outside of the focal organization. The 2007-2008 financial crisis exemplified the need for that wide cross-section of players in the organization's operations (Wuttke et al., 2016).

Financial supply chain management subsumes several business functions and processes that drive profitability and value, and highlights the thinking of several business practitioners and researchers that cross-functionality is more beneficial to value creation than functions operating as if they were independent. Wuttke et al. (2016) explain that financial supply chain management aims to bring together central players in the supply chain—namely, sellers, buyers, and the financial institution. This collaborative arrangement is known as reverse factoring, a term sometimes used synonymously with financial supply chain management (Dello Iacono, Reindorp, and Dellaert, 2015). These researchers argue that finance officials and supply chain managers are both responsible for reverse factoring.

In reverse factoring, the seller sends the invoice to the buyer in accordance with the usual business arrangement between the two. The buyer approves the payments, but if the seller needs the payments earlier than the agreed-upon arrangement, the seller can request immediate payment at a discount, from the buyer's financial institution (the factor). If all parties agree, the financial institution forwards payment to the seller, and then offers the buyer a longer time to pay. The seller's receivable days are shorter, and the buyer's payable days are extended, an arrangement that is beneficial to the cash-to-cash cycle for both buyers and sellers (Zhao and Huchzermeier, 2019), and improves their cash flows. The objective of reverse factoring is to simultaneously reduce working capital that is unnecessarily tied up in the supply chain, and, according to Wuttke et al. (2016), to promote stability in cash flow management, a situation that is desirable to grapple with uncertain business conditions. So, reverse factoring strengthens the relationship between firms in that it minimizes the default risks that cause supply chain interruptions (Wuttke et al., 2016).

The achievement of the principal objective of the firm hinges on the structures that the firm erects to manage risks. Zhao and Huchzermeier (2019) argue that both supplier and buyer should be able to mitigate the risk of non-payment, thereby being able to monitor and manage working capital more efficiently and effectively. With the adequate and certain flow of funds, firms will be able to fill orders promptly, and buyers will be assured of adequate inventory to satisfy customer demands. In fact, if one firm along the supply chain is exposed to any vulnerability, there is a contagion effect for the other chain players. This is particularly true of small and medium-sized firms that tend to encounter greater difficulties accessing external funding, and are heavily reliant on the smooth flow of working capital (Zhao and Huchzermeier, 2019). Financial supply chain management can help to obviate that problem. Additionally, to ensure their survivability, small and medium-sized firms usually avoid high-interest loans to conduct operations, which is also mentioned by CFOs in even larger businesses.

Hofmann et al. (2011) postulate that the provision of easy access to financial resources is an important variable in the value-creation objective of the organization. Wuttke et al. (2016) point out that financial supply chain management helps to lower operating costs because it provides an ample supply of working capital available without the high cost of capital it would otherwise take to access that capital in a case where it was difficult to collect on its accounts receivable.

One of the principles of supply chain management and supply chain integration is the issue of transparency among supply chain members. FSCM enhances transparency and communication because there is a collaborative negotiations among sellers, buyers, and financial institutions. Hartmann, and Feisel (2016) contend that one of the main reasons for the emergence of FSCM is to encourage individuals and firms to begin to look at the supply chain as an important driving force of the firm's financial performance and operational flexibility, where too many resources are now being invested in securing financial alternatives. The authors explain that when both functions are vested with the responsibility of facilitating successful organizational outcomes, the firm is simultaneously utilizing its human and financial capabilities to an optimal degree.

Much of the research that tries to develop and expose the link between supply chain and working capital is dated, most prior to 2010, and very sporadic at best. That was partly due to the somewhat tranquil economic environment (Hofmann et al., 2011). However, as economic conditions became uneven, and the need for working capital intensified, researchers changed from merely using accounting data to show relationships, to more seriously concentrating on how to finance the supply chain which became the main proxy for revenue generation and competitive advantage (Christopher, 2015). FSCM was introduced to fill that gap.

Liebl, Hartmann, and Feisel (2016) express concern that the success of FSCM depends on the individual idiosyncrasies, knowledge of the economic landscape, and a recognition of the complementarity among functions. The following section is devoted to the contribution complementarity theory can make to this study.

2.9 Complementarity Theory as a Driver of Resource Utilization

The tenets of goal interdependence are mirrored in complementarity theory (Lu and Tjosvold, 2013). Complementarity engenders simultaneous aggregation and disaggregation because the performance of each department or function is being monitored and evaluated by that of another department or function. Two departments, for instance, (x) and (y), working together, are expected to produce a higher value for the firm. Complementarity is best known for its association with quantum physics (Englert, Scully, and Walther, 1991), but it achieved tractability in the works of Milgrom and Roberts (1995), who define it as the level of interdependence at which doing more of one thing enhances the performance of another. Christopher and Ryals (1999) posit that as businesses begin to find ways of establishing competitive advantage and differentiation to cope with uncertainty, they are discovering that the formulation of business strategies should cut across departments, especially finance, operations, and marketing, and that financial planning should not continue to dominate the boardroom. So, instead of setting financial objectives separate from strategic objectives, it may be prudent and strategic to set financial objectives underpinned by clear operational objectives. For example, an X% increase in revenue by decreasing operational costs from A% to B%, so that two objectives work as complements (Barney, 1991). The author also points out that complementarity provides a very convincing starting point for a discourse in achieving a coherent perspective of a company's mission.

Sirmon et al. (2011) explain that complementarity theory resembles resource-based theory that shows that the efficient utilization of resources in the organization is essentially the development and improvement of resource capabilities that in turn improves efficiency. Christopher (2016) makes this point in relation to supply chain management, noting that for the effective operation of the supply chain, all resources should be engaged in a synergic way. He explains that efficiency is one of the main objectives of supply chain management, and that companies that have not taken advantage of the full complement of supply chain capabilities usually incur high operational costs.

In a similar observation, Dekker, Ding, and Groot (2016) note that successful companies can address inefficiencies in a very short period of time because they tend to make decisions by invoking multiple variables simultaneously. In that way, companies aim to maximize their resources. The opposite was observed at CSM Tools as some employees expressed that they spent time "waiting for information to process transactions." This could also be attributed to complacency, which according to Simon (1955), people, acting on their own, are not willing to seek optimal solutions, but are willing to settle for "satisficing" instead, because, based on bounded rationality theory, optimality cannot be achieved. Conversely, Dekker, Ding, and Groot (2016) believe that individuals too often relent in their quest for a higher level of satisfaction. Complementarity theory is grounded in team functionality because, working independently, an individual may concede before achieving greater value (Milgrom, Qian, and Roberts, 1991).

Choi, Poon, and Davis (2008) contend that complementarity theory builds organizational equity, defined as utilizing combined resources over a period of time to build organizational success. Deutscher et al. (2016), and Malhotra and Mackelprang (2012) argue that the concept of complementarity is an excellent reasoning tool through which integration should be discussed. The concept of complementarity proved very enlightening in the current study to frame interdepartmental integration of supply chain management practices and working capital theory.

Christopher (2016) argues that supply chain integration and supply chain orientation could be explained by complementarity theory. Supply chain success is based on the implementation of systems that support one another. For example, financial structures should be implemented to safeguard supply chain practices, to prevent supply chain interruptions (Hofmann et al., 2011). In fact, Hofmann et al. (2011) state that complementarity in working capital and supply chain management makes for quick response to customer requests and needs, operational efficiency, and the optimization of human resources, which are essential drivers of overall financial performance of the firm.

Cao et al. (2019) exhort firms to ensure that channel managers and associates understand that the satisfaction of customers, one of the primary goals of the firm, is achieved through partnerships, either interpersonally or institutionally. Additionally, the authors note that the concept of total quality management (TQM) is predicated on the complementary roles of various people and departments to connect the upstream and downstream supply chain activities.

Kaplan and Norton's (1992) balanced scorecard principles are geared towards the creation of an integrative environment in which every department, unit, and individual understand that the achievement of the firm's objective is the result of their collective commitment. The balanced scorecard combines financial variables, customer value, key business functions, and organizational learning to demonstrate cohesiveness of purpose. Lynch et al. (2012) postulates that within a balanced scorecard framework the effects of the mismanagement of the financial crisis could be minimized because everyone would be engaged in monitoring the environment. There was too much emphasis on financial yields, without the underlying functions being measured equally. Templar, Hofmann, and Findlay (2016) cogently note that a commitment to the creation of value demands a concerted effort to converge behaviors and activities.

Human behavior plays an important role in this study, and as such, the next section examines pertinent literature on how individual decisions can influence goal achievement.

2.10 Influence of Human Decision-Making on Organizational Goals

According to Hayes, Wheelwright, and Clark (1988),

> *"Superior performance is ultimately based on the people in an organization. The right management principles, systems, and procedures play an essential role, but the capabilities that create a competitive advantage come from people—their skill, discipline, motivation, ability to solve problems, and their capacity for learning." (p. 242).*

In a similar manner, Vygotsky (1978) writes: *"All the higher functions originate as actual relations between human individuals."* (p. 57). Thus, the centrality of human decision making to work together to attain organizational goals should not be disregarded. Deutsch (1949) points out that an organization has a multiplicity of goals that may be arranged in departments but are achievable only in an interdependent manner. In this manner, he asserts, the willingness of humans to work together to achieve those goals are paramount for organizational efficiency. As the above quote from Hayes, Wheelwright, and Clark (1988) states, it is ultimately the responsibility of individuals to facilitate goal achievement in the organization.

West (2012) posits that individual would also need to know that their goals are compatible with those of the firm for him or her to be fully engaged and motivated to work together. At the same time, individual goals may take precedence over firm goals, and that selfishly pursuing one's goals may hinder the achievement of both individual and firm goals (Deutsch, 1949). These presumptions are embedded in the philosophy of behavioral theory of the firm. Simon's (1955) discussion of the personal goals relative to the goals of the organization is particularly insightful in translating the complex juxtaposition of different individuals in a unit or firm with the expectation of unified outcomes. According to Simon (1955), and echoed by Gavetti et al. (2012), management should insist that individuals understand the actions, goals and lived experiences of one another, because it is only with such understanding that the organization can optimize its capabilities to operate cost-efficiently.

Gavetti et al. (2012) note that many operational deviations are caused by social and cognitive determinants, such as ability to understand the other person's needs and goals, the expectation of outcomes, and self-efficacy, the level of confidence the individual exhibits on the team. For example, supply chain activities are reciprocal, and requires an understanding and confidence on the part of supply chain managers that if one area is incomplete, the entire chain in in peril (Christopher, 2016). Schiller (2008) and Du and Budescu (2018) pose a similar argument that in the area of finance individuals tend to make financial decisions without reference to other factors that could jeopardize their decisions and the expected outcomes. This was played out in the financial crisis that has become a classic point of reference for bad organizational decision making. For example, certain behavioral characteristics, such as selfishness, introversion, and lack of communication at CSM Tools have been said to cause the organization to lose revenue over several years.

Du and Budescu (2018) note that a large body of behavioral research has begun to take shape, not only in finance, but in business in general, as researchers and practitioners have come to realize that human behavior greatly impact the level of success that organizations experience. However, Gavetti et al. (2012) assert that there has not been any overlap in terms of how the findings of the individual disciplines can help the organization achieve its goals. The authors further argue that we may need to find a more integrative perspective, and this study has purported to do that, by drawing on the tenets of goal interdependence.

One issue that emerges from behavioral research is that as an individual undertakes a task, one of his or her main goals is to accomplish that task within a certain predetermined or perhaps unspecified time (Bazerman and Moore, 2017; Tversky and Kahneman (1974). At the same time, completion depends on ability, enthusiasm, the amount of interaction required, and access to the pertinent information. The context of decision-making and the completion of tasks is multifaceted, and goes beyond real data, to include human thinking. Even when models provide certain results, they are not slavishly followed, and sometimes meetings are held to determine the best course of action. Also, depending on how the plan is framed (Graham and Harvey, 2001), projects are often funded based on the positions of power that the decision makers hold (Bendoly, Van Wezel, and Bachrach, 2015). So, organizational goals are achieved based on the level of involvement, of as Bazerman and Moore (2017) put it, the intersubjectivity of organizational decisions.

Zhao and Zhao (2015) experimentally analyze decision-making outcomes in supply chains with both full information exchange and no exchange of information, and find that in both cases, it is the human effect that supersedes. Decision making does not follow a set, mathematical formula, but is dominated by the decisions of humans. Human judgment and decision making under uncertainty are vulnerable to decision biases leading to deviations from the standard assumptions of the rational and linearity paradigm outlined in business functions. The authors note that supply chain managers are aware of the judgment and decision challenges that result from existing and increasing levels of uncertainty in the external, upstream supply chain, and they will examine the quantitative information, but that they generally do so in an attempt to debias their judgments. The diverse decision-making capabilities spread across the firm, or even within the same department, contribute to the complexity in the decision-making process, and encourages individuated planning if management is disconnected from the everyday happenings in the work environment. Pedroso, Da Silva, and Tate (2016) argue that a lack of cooperative planning may not be that management is oblivious, but could be caused by the unconcern of subordinates for the goals of others.

The bullwhip effect is often cited in the literature (Isaksson and Seifert, 2016) as a supply chain interruption caused by a lack of interdepartmental coordination where organizational goals are not aligned. The bullwhip effect is a mismatch between demand and supply, caused by incorrect forecasting due to information asymmetry between departments and forecasting systems. Very small variations in demand could result in large fluctuations in unwanted supply. Isaksson and Seifert (2016) argue that such a problem can be attributed to humans depending on models that they deem the standard of business operations. According to Simon (1955), humans frequently make decisions under conditions of bounded rationality, where they make do with what they have, or they "satisfice" rather than maximize the assets of the circumstance, a behavior that is in keeping with the rapidity with which firms need to act and react in modern business environments. Tversky and Kahneman (1974) give a similar perspective, pointing out that people tend to use seek information that supports a preconceived definition of the problem at hand. For example, at CSM Tools, and other organizations, getting a current ratio of 2:1 is benchmark for achieving liquidity, when other problems could be simultaneously occurring in the firm to offset that metric. The company could have assets invested in non-productive projects while displaying a metric that could be unrelated. Bernanke (2018) seems to agree. He believes that many decision makers today believe that it is too time-consuming to have to wade through a lot of information, so they make their decisions based on limited information, which sometimes fail to accomplish the intended goals.

The principal achievement of the research in behavioral disciplines is the discovery and explication that decisions are made based on human judgment and perceptions, emotions, and stereotypes, which are all prone to errors. In an examination of takeover and merger activities in the United Kingdom, Firth (1980) stresses that humans are prone to behavioral swings that quite often can clash in an organizational setting that has decision-making structures that are loosely coupled. Human cognition, coupled with the level of socialization, can enhance the extent to which organizational objectives are met. Gagne (2018) posits that as humans commit to translating their desires into an organizational purpose, there is a better chance that objectives will be achieved, and quality and productivity maintained.

Behavioral finance has pointed to the irrational exuberance of analysts that underlay the subprime mortgage crisis of 2007-2008 and the global financial crisis. It points out that, pressured to make rapid financial profits, people repressed rationality, only to later discover that the reward was not worth the risk, and that if they had brainstormed, and examined all the information at their disposal, they could have made better decisions. Customers were given mortgages without being scrutinized, and as economic conditions worsen, they defaulted, and approximately 90% of firms in that industry failed (Bernanke, 2018). I experienced this firsthand as I worked at a financial firm. Expediency is often more important. In fact, the adage “time is of the essence” is often echoed in business circles, as competition has forced the acceleration of processes.

Amir and Ganzach (1998) conducted laboratory research into the behavior of humans in economic decisions, and found that heuristics or “rule of thumb” plays a major role in human decision, and that results based on human behavior exhibit large deviations compared to results based on non-human data. The authors typologizes heuristics as representativeness, anchoring and adjustment, and leniency, an adaptation of the Tversky and Kahneman (1974) model, of representativeness, anchoring and adjustment, and availability, showing how at each level, human behavior molds outcomes. Under representativeness heuristic, the individual tends to stereotype actions. People base their actions on a sample of similar actions. An analyst may treat a client in a certain manner because that client has characteristics similar to those of another previous client.

In anchoring and adjustment, people look for precedence. For example, some organizations are inclined to follow a path that has brought them success, even if conditions require them to veer from that path (Qudrat-Ullah, 2014). There may be some adjustment, but it will not depart significantly from that path. With availability heuristics, the individual disproportionately remembers an occurrence based on the frequency of that occurrence, and his emotional attachment to it. The salience of an event is dependent on the impression people have of it. For example, an analyst will recall processing an order for a large sum of money, and the client filed bankruptcy. This incident will be remembered for a long time, and will color the processing of future transactions. In my organization, for instance, the credit initiation process is not automatic. The analyst reviews the application and approves or denies credit. The speed with which credit is granted or not depends on the discipline of the analyst, including the urgency he or she perceives should be given to the outcome. Responsibility for location, scheduling, design, resource planning, and other processes in operations, falls to individuals, aided by mechanical sources, and as Gagne (2018) notes, the organization cannot afford to treat the individual mechanistically, because their actions directly or indirectly impact organizational plans and strategy implementations.

2.11 Literature Review Summary and Conclusion

Some of the primary works reviewed are summarized in Table 1. The information is based on the central issues in this study, namely—goal interdependence, supply chain and working capital management, and financial supply chain management, and other elements such as human behavior and interdepartmental collaboration are referenced. In fact, the universal perspective of the researcher, even though they have researched divergent areas, is that collaboration, whether human, functional, intra-organizational or inter-organizational, is vital for organizational success.

Table 1 Literature Review Summary

Authors	Method	Arguments	Conclusions
Link between Supply Chain and Working Capital Management			
Hofmann and Kotzab (2010)	Exploratory single-company analysis with abductive reasoning	By optimizing the firm's working capital the supply chain will also be optimized	A collaborative approach between finance and supply chain management is necessary to create firm value
Richards and Laughlin (1980)	Financial ratio analysis	CCC = DIO + DSO – DPO, the cash conversion cycle is a better approach to measure a firm's liquidity than the current and quick ratios. The operating cycle (the length of time it takes a company to turn its inventory into cash) is a crucial indicator of working capital efficiency	Businesses are faced with the necessity of planning their working capital availability from the perspective of supply chain and inventory activities; this is necessary to avoid financial crises

Zhao and Huchzermeier (2015)	A risk-management framework	Operations and finance are two key functions that jointly drive business success. Operations optimizes supply chain processes, and finance allocates funds to facilitate those processes in a systematic risk management structure	Without the complementary association of finance and operations, businesses will fail
Wetzel and Hofmann (2019)	Explorative empirical inter-organizational analysis	Inadequate levels of working capital are affected by limited financial resources along the supply chain.	Working capital is a function of the access to, and allocation of financial resources allocated across firms' supply chains
Wuttke et al. (2016)	Bass Diffusion Model	The introduction of supply chain finance is a way to optimally guard the supply chain against financial vulnerabilities	Trade credit is a vital source of funding in the supply chain
Hoberg, Margarita Protopappa-Sieke, and Steinker (2017)	Data analysis of secondary data sources	The management of a firm's inventory has implications for the level of financial constraints across the supply chain	Inventory levels are affected by financial constraints and cost of capital.
Timme and Williams-Timme (2000)	Semi-structured interview with C-Level managers (CEO, CFO, and COO)	Supply chain solutions can help improve a company's overall financial performance	Improvements in the management of supply chain practices improves overall financial performance

Dello Iacono, Reindorp, and Dellaert, N. (2015)	Stylized Market dynamics model based on review of scientific and trade literature	Market dynamics, including changes in prices, and the behavior of employees and customers can significantly influence movements in the supply (value) chain	Supply chain actors, including finance officers, should consider market dynamic and economic factors in financing
Hofmann et al. (2011)	Review of a collection of studies from a cross-section of industries and countries	Managing the timing in terms of accounts receivable days and accounts payable days are a way of optimizing supply chain practices	The amount of financial capital committed to supply chain processes is important to enhance cross-company collaboration and to reduce supply chain risks
Christopher (2016)	Textbook studies	Effective supply chain management is crucial for the success of the firm	Management of the supply chain demands a holistic view from management
Aktas, Croci, and Petmezas (2015)	Cross-sectional empirical analysis of US manufacturing firms	Firms strive to achieve an optimal level of working capital, despite the fact that they do not have a coherent working capital policy	Firms that aim towards an optimal level of working capital improve their stock and operating performance
Baños-Caballero,García-Teruel, and Martínez-Solano (2014)	Mathematical modeling	Net trade cycle (cash conversion cycle) should be used to gauge the	An optimum level of working capital is required for

		demand for working capital	operational efficiency
Gill and Biger (2013)	Multiple case studies and cross-sectional data analysis	Corporate governance is associated with working capital management	Firms with good corporate governance policies are more efficient in the management of working capital policies.
Shin and Soenen (1998)	Correlation and regression analysis	Working capital should be measured in terms of the cash conversion cycle and operational performance	Working capital management plays a significant role in the creation of shareholder value, and should be an integral part of corporate strategy formulation
Deloof (2003)	Structural equation modeling and multiple case studies	Accounts receivable and inventory are determinants of operational efficiency	Firms with inefficient accounts receivable and inventory management practices experience problems in working capital cash flow
Goal Interdependence			
Deutsch (1949)	Conceptual modeling	Team members' perception of goal interdependence determines how they	Individuals will work cooperatively if they perceive

		collaborate and interact in the workplace	that their goals are interdependent, and only through collaborative processes and behavior will an organization achieve its predetermined goals
Deutsch, Coleman, and Marcus (2014)	Conceptual and multiple case studies	Team performance should trump individual performance	Organizational success and efficiency are greater within a team-oriented environment
Lu and Tjosvold (2013)	Conceptual framework and multiple case studies. Also model based on Deutsch (1949) theory of interdependence	Managers should facilitate a pathway to a cooperative goals, because this will help the organization overcome obstacles, and develop effective leadership	Cooperative goals result in the mutual solutions of organizational and individual problems
Wong, Tjosvold, and Zhang (2005	Surveys, interviews, and secondary firm data	Effective collaboration and communication are necessary to create value for the firm	Commitment to goal achievement through cooperative actions leads to effective strategic partnerships in the supply chain
	Heuristic model of interdependence based on	Individuals feel ostracized and isolated in the workplace when they perceive that goals can be	If individuals perceive that they are working towards different

	analysis of longitudinal firm data	achieved independently, but they also underperform	goals they will feel that their value is underappreciated
Kruglanski et al. (2013)	Multiple case studies	People pursue multiple goals and there are multiple ways to achieve those goals, but it is the responsibility of management to ensure that the paths to the achievement of goals are not actually bottlenecks for the organization	Organizations should realize that goals can be achieved in multiple ways, but the most important concern is that the overall goal of the firm is accomplished

A search using various search engines such as EBSCO, Discover, Google Scholar, Researchgate, and Microsoft Academic Search did not turn up any mention of goal interdependence in working capital and supply chain management. However, goal interdependence theory provides a strong scaffolding for the discussion on the relationship between working capital and supply chain management because the value of those functions to the organization revolves around overall goals of business achievement and financial outcomes (Zhao and Huchzermeier, 2019). In relation to this study, the central themes gleaned from the literature are organizational productivity, efficiency, effectiveness, profitability, liquidity, value-creation, and cooperative goal achievement.

The development and scope of the literature review is depicted in Figure 6.

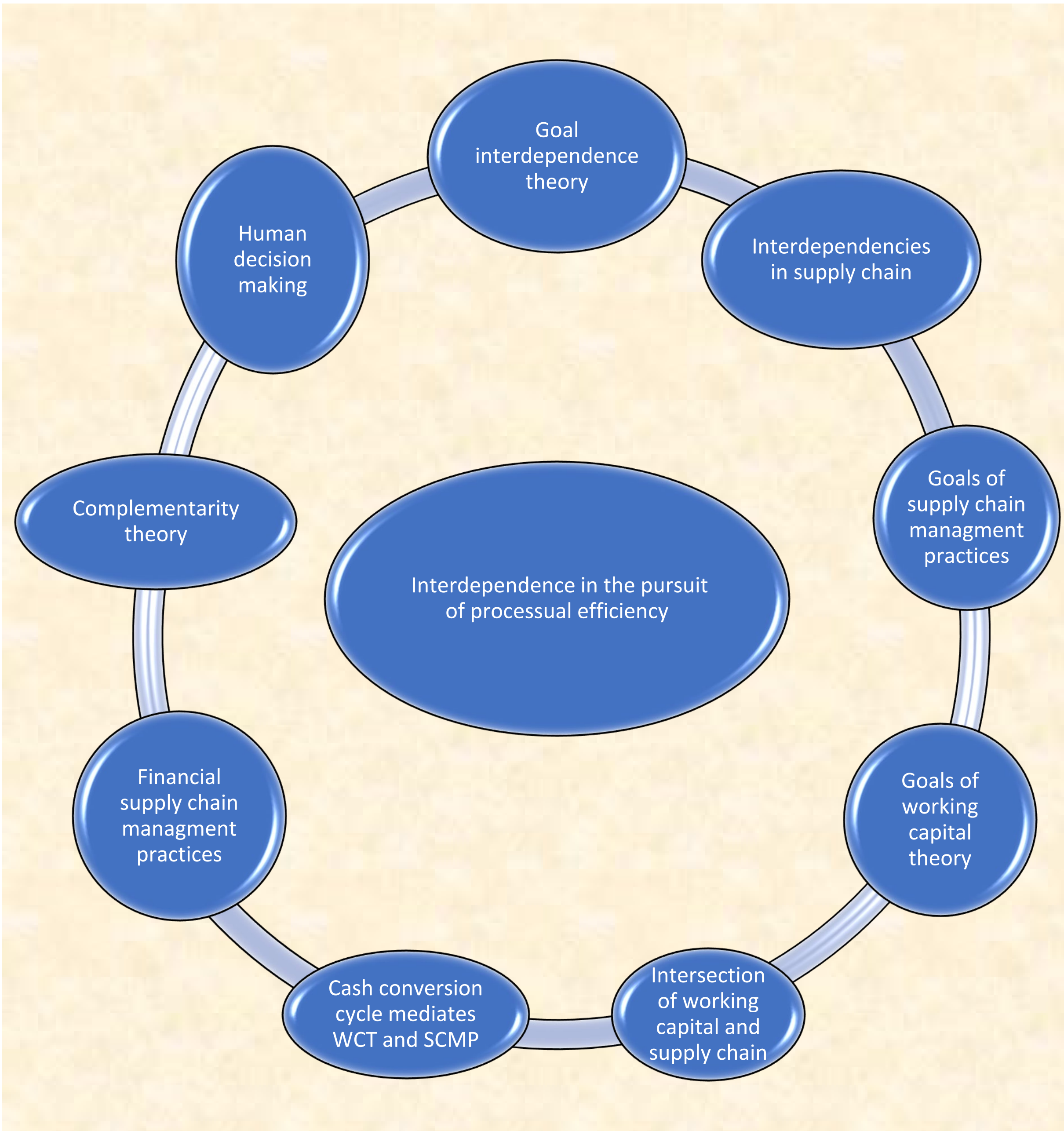

Figure 6 Conceptual Model of the Scope of the Literature Review

The scope and interrelationships of the variables in the literature review variables underscore the complex nature of an attempt to integrate functional processes and to achieve goal interdependence between working capital and supply chain management. As Richards and Laughlin (1980) point out, the management of supply chain processes is in itself a complex strategy for the organization, and the merging of those processes with those of working capital management demands extensive research that goes beyond the functions themselves. Richards and Laughlin (2008) are pointing to the principles outlined by Deutsch (1949) and Lu and Tjosvold (2013) in their treatises on goal interdependence, that individual perspectives play a significant role in the pursuit and achievement of corporate goals.

Borrowing the concept of circular flow from macroeconomics, the researcher shows in the framework that in pursuing operational efficiency between working capital and supply chain management, management has to insist on identifying the interdependencies among the various activities that are performed daily, as well as the functional goals, and how they are to be achieved. The variables outlined in the literature review framework are considered to have potentially significant impacts on the relationship between working capital and supply chain management. An understanding of goals and their interdependence, the cash conversion cycle and its effects on the inflow and outflow of cash for the company, financial supply chain management, which is the impact of financial institutions as intermediaries between the focal firm and its suppliers and customers, and the decisions made by individuals who are expected to understand how to generate success in functional relationships (Hofmann and Kotzab, 2010), and that all these interconnected variables impact the level of efficiency of the firm.

Wetzel and Hofmann (2019), Zhao and Huchzermeier (2019), and other researchers argue that research on the intersection of working capital and supply chain management has evolved through several stages, and involve several interdependent factors that flow continuously. The literature review reveals that business operations are predicated on finding congruence among disparate activities and relationships (Porter, 1998).

The literature was invaluable in helping the researcher to organize and focus his thoughts for the remaining chapters. Table 2 shows what the workplan will be.

Table 2 Workplan for Remaining Chapters

Chapter 3: Methodology	Chapter 4: Results and Findings	Chapter 5: Discussion, Implications, Limitations, and Future Research
❖ Overview of explanatory sequential mixed methods research ❖ Philosophical argumentation of mixed methods research ❖ Applying mixed methods in action research ❖ Participant Selection ❖ Quantitative data collection and analysis ❖ Other quantitative data: secondary data ❖ Qualitative data collection and analysis ❖ Thematic analysis ❖ Ethical considerations in action research ❖ Chapter summary	❖ Overview ❖ Mixed methods action research: cycle 1 ❖ Mixed methods action research: cycle 2 ❖ Mixed methods action research: cycle 3 ❖ Post-observation feedback and reflection ❖ Summary	❖ Introduction ❖ Research Questions Answered ❖ Action research, reflections, and implications ❖ Reflections of an evolved scholar-practitioner ❖ Implications for management and inter-departmental change ❖ Limitations and Suggestions for Future Research ❖ Conclusion

Chapter 3: Methodology

Introduction

The purpose of this study was to use the principles of goal interdependence to as lens through which to examine the intersection of supply chain management practices (SCMP) and working capital theory (WCT), and helping individuals to reflect on the roles of the functions as they relate to the overall organizational objectives of value creation and maximization, and customer satisfaction. Based on the aims of the study, the research questions (figure 7) were developed. This chapter outlines the significance of action research and the case-study approaches, and the rationale for adopting them. Also included are the procedures followed to collect and analyze data, participant selection, and the ethical issues involved in the research.

This is an explanatory sequential mixed methods design, and the insights that emerge rely mainly on documental revision (Creswell, 2017), purposive sampling and analysis, observation, and semi-structured interviews, and are used to assess the mediating role of goal interdependence in the relationship between working capital and supply chain management. Any other incidental techniques will be highlighted and discussed accordingly. As previously stated, the methodology employed in this study aims to answer the research questions outlined in figure 7.

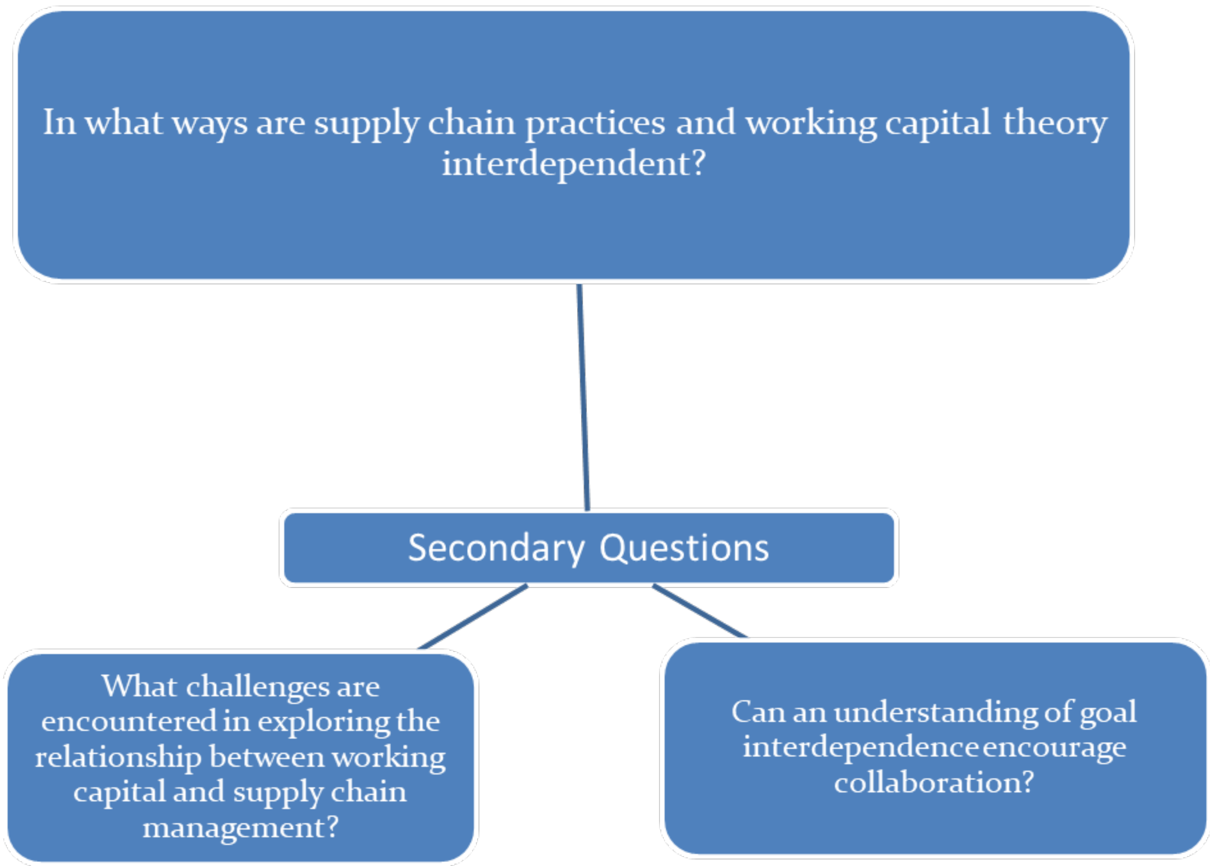

Figure 7 Primary and Secondary Research Questions

3.0 Role and Purpose of Mixed Methods Research in this Study

Most of the extant research on supply chain and working capital management policies employs the quantitative approach, with few researchers (Coughlan and Coghlan, 2002) asserting that qualitative research in the form of action research could be used to in operations research and other areas in business. Upon reviewing the literature, the researcher realized that the primary research question: "In what ways are supply chain practices and working capital theory interdependent?" could be examined using quantitative techniques, but that further investigation through a qualitative lens would be necessary to capture how employees viewed the relationship between the functions. One aim of the study, and an inherent characteristic of action research, is collaboration between individuals, and according to Deutsch (1949), goal interdependence rests on collaboration. These arguments, coupled with the secondary questions: What challenges are encountered in exploring the relationship between working capital and supply chain management?" and "Can an understanding of goal interdependence encourage collaboration?' made it apparent that the mixed methods approach was appropriate for the study.

Mixed methods research integrates quantitative and qualitative research approaches in the study to comprehensively address those research questions. Quantitative data were collected based on a closed-ended questionnaire, and the results analyzed on a Likert scale. This process was followed by a qualitative phase based on a semi-structured interview. The results and findings of both phases were triangulated to get a deeper understanding of the supply chain-working capital interface.

The growth of the researcher throughout the DBA Program that has emphasized the creation of actionable knowledge by employing eclectic methods, facilitated the decision to undertake mixed methods approach to this study. Ivankova (2015) combines action research and mixed methods research philosophies that is believed to capture and report in a robust manner, the essential aspects of modern organizational settings. The active inclusion of stakeholder inputs beyond the reliance on positivism is part of the robust appeal of mixed methods research (Creswell, 2017). The mixed methods approach bridges the gap in traditional business research, especially in the areas of finance and operations management where quantitative techniques dominate (Coughlan and Coghlan, 2002). In fact, the action research mixed methods approach provides a more collaborative and reflective posture that makes for a more interactive research environment (Ivankova, 2015).

Considering the complexity of the relationship between the functions being studied, a single method would be inadequate (Creswell and Plano-Clark (2017). Richards and Laughlin (1980) point out that trying to integrate working capital and supply chain management from purely quantitative or cash-conversion cycle perspective may result in inconsistent results, and several authors (Deloof, 2003; Shin and Soenen, 1998) argue research on the relationship between working capital and supply chain management have turned up inconsistent results. As such, the mixed methods approach in this study highlights the human involvement that could be contributing to those inconsistencies, and allowed the researcher to elaborate on the practical importance of integrating functional goals to enhance the efficiency of the daily activities that the employees at CMS Tools undertake. A more philosophical discussion of mixed methods research is given in section 3.2.

3.1 Overview of Explanatory Sequential Mixed Methods Research

To address the research questions in this study, the explanatory sequential mixed methods research design in the form of QUAN → QUAL (Creswell and Plano-Clark, 2017) is used.

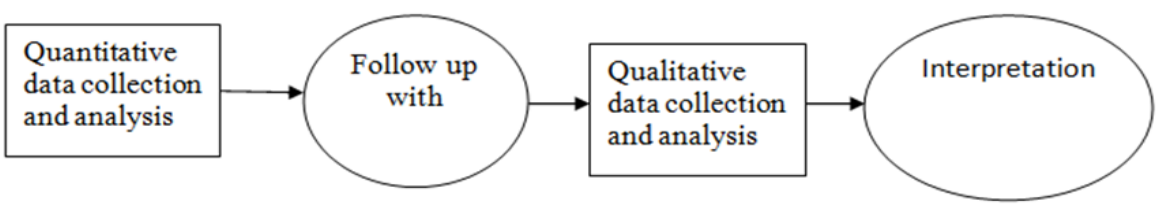

Figure 8 Explanatory Sequential Mixed Methods Design: Source: Creswell and Plano-Clark, 2017. p. 62.

The explanatory sequential design is made up of two phases: a quantitative phase and a qualitative phase (Plano Clark, 2011). The collection and analysis of quantitative data is followed up by the collection and analysis of qualitative data. The qualitative findings are used to help explain or elaborate on the quantitative results, or to select participants to better understand the results (Plano Clark, 2011). For instance, in the current study, the quantitative phase consists of a closed-ended questionnaire in a Likert scale format. This phase is then followed up with a semi-structured interview. The results and findings from both phases are then triangulated. This is further discussed in chapter 4. The rationale for this approach is that the quantitative results provide a general picture of the research problem, and the qualitative findings are used to refine or extend that general picture, and to provide more insights (Creswell and Plano-Clark, 2017). As depicted in figure 8, the results of the qualitative phase are used to develop or inform the quantitative phase.

For instance, in the qualitative phase, the researcher wanted to explore more deeply the views and attitudes expressed by the participants regarding the importance of goal interdependence, and the relationship between working capital and supply chain management. And since goal interdependence between the two functions are not covered in the literature, and this is new territory, people's ideas and impressions were a good starting point to gain insights into the subject, and to develop a theory (Kemmis, McTaggart, and Nixon, 2014). A later section is devoted to participant selection.

Much is known about the importance of working capital and supply chain management in the organization, but the interdependence of the goals of these functions remains unexplored, and there could be several intervening factors that impact the pursuit and achievement of those goals. As Creswell and Plano-Clark (2017) argue, relationships among variables may seem linear, but through further investigation, that linearity could be spurious. As the literature points out, commonsense would dictate that finance and operations work as complement functions in the same organization, but research proves otherwise (Zhao and Huchzermeier, 2019).

Creswell (2017) emphasizes that the triangulation of results and findings can reveal complementarity among processes, and can initiate, develop, and expand principles and issues. As mentioned earlier, the literature does not specifically discuss how the joint goals of working capital and supply chain management contribute to value creation, and what other variables could be taken into consideration. Thus, by interviewing and observing the participants, and allowing them the explain their procedures and actions, the researcher was able to get an idea of what other variables could facilitate or impede the alignment and cooperative achievement of goals.

CSM Tools' employees at all levels have expressed support for cross-functional coordination, but there seems to be no follow-up to determine if such coordination is taking place, and practice does reveal the opposite as individuals seem to go about their business independently, with no consideration of how their actions could impact others. At times, when transactions go awry, management and other individuals then try to do postmortem examination to understand what happened. For example, there have been frequent disparities between timely delivery of product to customers and the receipt of payments, with no communication taking place between finance and operations analysts. The literature points out that if individuals are committed to working cooperatively, the delivery system and the level of quality management seeks for its customers could be enhanced. However, there is no clear suggestion given as to how this can be done, so, following the proposal by Creswell and Plano-Clark (2017), a core set of variables can be determined from the semi-structured interviews, observations, and conversations with employees, and the qualitative phase was used to get their impressions of why there was not much coordination in the functional activities.

The intent of using the explanatory sequential phase was to move beyond the mere feeling that things were not being done cooperatively, and to generate a theory grounded in specific

Criteria						
Timing	Designs	Weighting	Mixing/ stage of integration	Notation	Theoretical perspective	Description
Sequential	Explanatory	Usually quantitative	Interpretation phase	QUAN→qual	May be present	The researcher seeks to elaborate on or expand the findings of one method with another method
	Exploratory	Usually qualitative	Interpretation phase	QUAL→quan		
	Transformative	Qualitative, quantitative or equal	Interpretation phase	qual→quan or quan→qual	Use of theoretical perspective (e.g. advocacy)	
Concurrent	Triangulation	Preferably equal; can be quant or qual	Interpretation or analysis phase	QUAN + QUAL	May be present	The researcher converges two types of data at same time to provide an inclusive analysis of the research
	Embedded	Qualitative or quantitative	Analysis phase	QUAN(qual) or QUAL(quan)		
	Transformative	Qualitative, quantitative or equal	Usually analysis phase, can be interpretation phase too	qual + quan or quan + qual	Use of theoretical perspective (e.g. advocacy)	

Figure 9 Mixed Methods Design Types-- Source: Creswell and Plano-Clark, 2017, p. 52.

primary data (Creswell and Plant-Clark, 2017). The information was analyzed using thematic analysis (Braun and Clarke, 2013), eliciting codes and themes. As such, this approach was suitable in the sense that it afforded the researcher the opportunity to get information that could not be obtained using the quantitative approach, to explain the lack of coordination within specific inter-relational contexts (Creswell and Plano-Clark). Timing in data collection is very important in research. In figure 9, Creswell and Plano-Clark (2017) state that the phases of data collection in the mixed methods approach can be categorized into sequential or concurrent. The sequential has been discussed earlier, and is the form of this study. In the concurrent format, both quantitative and qualitative data are collected at the same time.

The concurrent format could not be used in this study because of time constraints and workloads of participants. The data collection needed to be spread out to be less onerous and intrusive. At the same time, as Creswell and Plano-Clark (2017) explain, the concurrent design could present problems to the inexperienced researcher as he or she may not be able to reconcile emergent problems in the data, and it would prove time-consuming to go back and forth to analyze the findings.

It should be pointed out that even though qualitative data are used to help explain or elaborate on the findings in the quantitative phase, equal priority is given to both quantitative and qualitative data (Creswell and Plano-Clark, 2017), hence the QUAN → QUAL notation. The rationale for using this approach is that the quantitative data provides a general picture of the problem, and the qualitative data should help to narrow down the issue, and provide more clarity. It could provide reasons for discrepancies and anomalies in the quantitative data. Also, this design is used when the researcher has good knowledge of the quantitative data and results, but needs to explain why they are not being implemented (Creswell and Plano-Clark, 2017). For example, the literature review shows that there is complementarity between supply chain and working capital management (Hofmann and Kotzab, 2010), but there seems to be a discrepancy in terms of how processed in the two functions are performed on a day-to-day basis, and how employees perceive the two functions to operate. Even though the exploratory design is used when the topic is not fully developed in past research, such as goal interdependence to analyze the relationship between supply chain and working capital management, I opted for the explanatory design because I have knowledge of the quantitative relationships between the functions, but needed to understand why there was a problem in linking them at CSM Tools.

The explanatory sequential mixed methods design is within the mixed methods research tradition, so it is important to examine the relevance of mixed methods research as it applies to this study.

3.2 Philosophical Argumentation in Mixed Methods Research

For many years, academia and professional journals have been appealing for eclecticism in research to reflect the reality and diversity of issues being researched (Tashakkori and Teddlie, 2020; Donohue, Ozer, and Zheng, 2019; Creswell and Plano-Clark, 2017; Coughlan and Coghlan, 2002). These authors point to the necessity of both quantitative and qualitative methodological approaches in order to undertake meaningful research in both the social sciences and business disciplines. Creswell (2017), one of the most prolific academic researchers in the field of mixed methods research note that international and interdisciplinary interests, as well as funding opportunities exist to conduct mixed methods research. Tashakkori and Teddlie (2020) refer to mixed methods research as the "third methodological movement" because of its potential to produce and examine more context-specific evidence.

Mixed methods research involves the collection, analysis, and integration of quantitative and qualitative research in a single study. Quantitative research involves the collection of numerical data, which can be analyzed using mathematical and statistical methods. Qualitative consist non-numerical data, such as open-ended questionnaires, observations, and interviews (Creswell, 2017), which can be analyzed using thematic analysis, and other non-statistical techniques. For example, the qualitative data in this study is done using thematic analysis, and Cronbach's Alpha for internal consistency and validity (Saunders, Lewis, & Thornhill, 2015). These will be discussed in Chapter 4.

While mixed methods research has been a tradition in the social sciences, it has not taken root in business, especially in operations and financial management (Tashakkori and Teddlie, 2020; Coughlan and Coghlan, 2002). This is due mainly to the adamance of prominent business management journals to accept mixed methods, and more so qualitative research as rigorous enough to be included in the pantheon on business research (Gehman et al., 2018).

However, Donohue, Ozer, and Zheng (2019) argue that mixed methods research is more suitable for certain cases in business, because of the dynamic nature of business, and the multiplicity of variables that impact business decisions and operations. This perspective aptly fits the research topic of this study which is predicated on goal interdependence. In studying the interactions of individuals as they pursue their goals, Lu and Tjosvold (2013) postulate that by not limiting oneself to a single method of getting information from individuals, one is able to engage in open discussions of diverse issues, and to explain certain problems that one unexpectedly encounters. The authors note that goal interdependence theory transcends methodological limitations, and should be pursued multivariately. Lu and Tjosvold (2013) point out that goal interdependence theory is characterized by a keen sense of reflexivity that cannot be successfully examined through quantitative analysis. They also note that reflexivity is necessary to ensure that individuals are engaged in conversations regarding their goals and achievements. Teams that achieve interdependent goals are in continuous dialog (Lu and Tjosvold, 2013). This study aims to find support for this argument, by investigating the performance of employees as they engage in continuous dialog to ensure that the goals of both working capital and supply chain management are not only achieved, but more importantly, in an interdependent manner.

Arguing in a similar manner, Creswell and Plano-Clark (2017) state that researchers should not restrict themselves to any single methodological approach because organizations are dynamic entities and should be investigated from a dynamic standpoint. Hence, these authors are strong proponents of mixed methods research.

From an epistemological and ontological perspective, mixed methods envelops three basic research paradigms, namely—positivism, constructionism, and pragmatism (Creswell and Plano-Clark, 2017) shown in figure 10. That is, mixed methods researchers incorporates each paradigm in a single study, whereas quantitative and qualitative studies use only one at a time. Positivism espouses that knowledge should be obtained through observable and measurable facts, and that

	Positivist	Interpretivist/ Constructivist	Pragmatic
Ontology *Nature of reality*	Single reality	No single reality	Social real life issues
Epistemology *Nature of knowledge*	Observer is independent of that being researched	Observer is dependent of that being researched	Combination of both
Axiology *Role of the researcher*	Unbiased	Biased	Goal- oriented
Methodology	Quantitative	Qualitative	Mixed Methods
Data Collection	• Experiments • Quasi-experiments • Tests • Scales	• Interviews • Observations • Document reviews • Visual data analysis	• May include tools from both positivist and interpretivist paradigms. Eg Interviews, observations and testing and experiments.

Figure 10 Typology of Research Paradigms

the researcher is detached from the subject of the research, and objectivity should be maintained at all times. This is the philosophical stance that has dominated operations and finance research for a long time, hence the challenge of doing mixed research in those areas, and the reason for the paucity of research on interdependence theory as it relates to working capital and supply chain management. It can be considered a rigid form of scientific inquiry (Gehman et al., 2018; Kemmis, McTaggart, and Nixon, 2014). Quantitatively-oriented researchers operate within the positivistic tradition.

In contrast, constructionism, also referred to as interpretivism, posits that reality is socially constructed through the interaction of people. The constructivist research is actively involved in the subject being studied, and subjectivism is not precluded. Qualitatively-oriented researchers operate within a constructivist tradition. The construct of social constructionism was instructive in this study to in trying to understand the role of individuals in the interdependent achievement of goals in working capital and supply chain management.

The third epistemological posture, pragmatism, is closer to constructivism in that it is rooted in real-world practice, it is problem-centered, and it adopts the perspective that any method that solves the problem should be used (Creswell, 2017). Thus, pragmatism is ontologically associated with mixed methods research (Creswell, 2017) that incorporates both quantitative and qualitative approaches to achieve a more profound examination of the subject. The interplay between the two approaches is important for the revelation of greater insights into the subject under study (Creswell, 2017). Mixed methods research is used when either the qualitative or quantitative approaches are not sufficient to address the research problem as in the case of the current research. The subject of this study falls within the pragmatic epistemology, and hence the use of mixed methods.

Certain challenges arose in undertaking mixed methods research at CSM Tools, and also inherent in action research, which will be discussed later in this chapter. One was the involvement of participants from whom qualitative information would be obtained, especially when they had their daily activities to perform, and had to be convinced of the benefits of participating. Additionally, because there were multiple steps involved, it was time-consuming, and I had to be very careful to not encroach on the time of the participants for fear of discouraging participation. It was also challenging to determine which issues needed to be the focus at the point of interface (Creswell, 2017), and which participants would be willing to continue with the process.

One common challenge in undertaking mixed methods research, is that the researcher needs to be conversant in collecting and analyzing both quantitative and qualitative data. Prior to pursuing the DBA Program, I was not accustomed to doing qualitative research, but the DBA courses required skill in both approaches, and that skill has proven invaluable for this study topic, to explain concepts such as human relationships in cross-functional activities and the attainment of cross-functional goals. In fact, the need to further investigate the behavior of individuals in the formulation and implementation of business practices initiated the slow acceptance of a more eclectic research philosophy in business (Gehman et al., 2018), as evidenced in the emergence of behavioral research in finance, operations and supply chain management, and business anthropology in consumer research.

Of a more practical nature is the value of bringing to business and management a worldview that business concepts should be explained and amplified to broaden the scope and purview within which business decisions are made. In fact, the mixing of methodologies has been classified as performing five main functions: to triangulate, to complement, to develop, to initiate, and to expand (Bell, Bryman, and Hartley, 2018). To triangulate is to seek convergence among the findings in both quantitative and qualitative data. To complement is to find areas of commonality and correspondence in the data. To develop is to use the results of one method to develop ideas and information found in the other method. To initiate is to discover ways in which one method can help to recast findings of the other method. To expand is to see how the findings of one method can amplify the findings of the other method. Essentially, the main emphasis of the five classes is on a more profound understanding of an issue (Bell, Bryman, and Hartley, 2018).

This study uses the triangulation function. Denzin (2009) proposes four categories of triangulation: (1) data triangulation, (2) investigator triangulation, (3) theoretical triangulation, and (4) methodological triangulation. Data triangulation uses multiple data sources aimed at obtaining differing perspectives about a particular topic. The information can be obtained over time, through space, and from persons (Denzin, 2009). Investigator triangulation uses two or more researchers to investigate the data for verification and validity. Theoretical triangulation is the use of all possible theoretical interpretations of the data to glean multiple perspectives and interpretations, as different persons can interpret the same phenomenon in different ways. Methodological triangulation is the use of two or more research methods (quantitative and qualitative), for instance, to investigate an issue. According to Gioia, Corley, and Hamilton (2013), it is not improbable to fuse all four categories in a particular study, but the main focus can be on one. In this study, for example, methodological triangulation is used, but signs of investigator triangulation as participants were involved (Denzin, 2009) in verifying codes, themes, viewpoints.

According to Kemmis, McTaggart, and Nixon (2014), research is the correspondence between theory and practice, and while theory can inform action, theory and action can work together to inform organizational success whose variables should be holistically studied. This is the principle on which action research rests. Since this is an action research study using mixed methods research, it is relevant to examine the application of mixed methods action research in this study.

3.3 Applying Mixed Methods in Action Research

As mentioned earlier, a mixed methods mode of inquiry was more suitable for investigating the relationship between working capital and supply chain management from a goal-interdependence perspective. Throughout the DBA experience, and given the inclusion of several variables in this study, as well as the import of trying to address a practical organizational problem, it was apparent that undertaking a research that allowed for reflection at all stages was appropriate. As such, I followed the recommendations of Ivankova (2015) that the incorporation of mixed methods in action research is a great way to reflect from several angles while investigating a practical issue.

Because of its flexibility, mixed methods can intersect with various methodological frameworks (Creswell, 2017), sch as action research to devise an integrated structure for addressing a practical problem (Ivankova, 2015). Action research is based on the same procedural and philosophical principles of mixed methods research, so it is very feasible and practical to combine them in a single study to produce more robust discussions of the research topic (Ivankova, 2015). However, compared to the traditional mixed methods research, the combination of mixed methods and action research (MMAR) requires a collaborative effort and a certain level of reflection throughout the research process, which is the essential part of action research. When undertaking traditional mixed methods research, apart from combining qualitative and quantitative approaches, it is important to consider the sequencing (Creswell and Plano-Clark, 2017), and the dominance of those approaches (Tashakkori and Teddlie, 2020). Sequencing, as outlined earlier, defines which approach, quantitative or qualitative, is used in the first phase of the research, and dominance relates to which approach is given more emphasis. For the current study, the explanatory mixed methods research was used where quantitative data were collected from employees via a closed-ended questionnaire, followed by the collection of qualitative data via a semi-structured questionnaire, observations, and interviews of select employees at CSM Tools. (Figure 11).

It has been discussed that research paradigms are incommensurable (Easterby-Smith, Thorpe, and Jackson, (2015). That is, they argue that due to the underlying principles and demands of the various paradigms, it is difficult to combine them in a single study. Although this might be a reasonable evaluation, Ivankova (2015), and to a lesser extent Creswell and Plano-Clark),

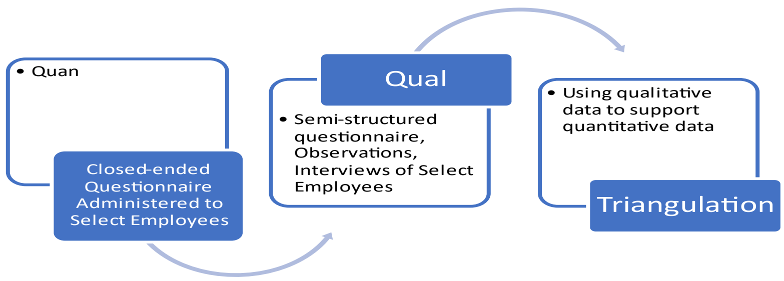

Figure 11 Flow of the Data Collection Process

demonstrate and argue that paradigms can be successfully merged, in the case of mixed methods and action research. Action research is not limited to a single mode of inquiry, and can therefore, incorporate a wide range of methods from other paradigms (Kemmis, McTaggart, and Nixon, 2014). At the same time, mixed methods research combines both quantitative and qualitative approaches, and as such, there are certain methodological orientations similar to both action research and mixed methods research, which make the two paradigms compatible for empirically scientific research planning, evaluation, and eventual implementation of results (Ivankova, 2015). Johnson and Onwuegbuzie (2004) point out that both qualitative and quantitative researchers employ empirical data to address their research questions, hence a similarity between the two approaches.

Additionally, MMAR can stimulate organizational stakeholders to develop an appreciation for evidence-driven decisions because they can see the origins of the evidence unfolding in the workplace (Ivankova, 2015). As defined by Shani and Pasmore (2016):

> *"Action research is an emergent inquiry process in which applied behavioural science knowledge is integrated with existing organizational knowledge and applied to address real organizational issues. It is simultaneously concerned with bringing about change in organizations, in developing self-help competencies in organizational members, and in adding to scientific knowledge. Finally, it is an evolving process that is undertaken in a spirit of collaboration and co-inquiry* (p. 191).

This definition captures the essence of my study, which is the behavioral underpinnings of inter-departmental collaboration. For Lewin, the father of action research, it was a process through which to investigate social consciousness as it relates to changing and reflecting on actions, and at the same time creating knowledge about a system (Shani and Pasmore, 2016). Goal interdependence theory posits that the organization is more behavioral than it is positivistic (Lu and Tjosvold, 2013), and is built around influencing the attitudes of individuals as this study sets out to do at CSM Tools, to demonstrate the commitment to work collaboratively towards efficiency and success. Shani and Pasmore (2016) explain that mindset can temper or exacerbate stress, and the direction in which the situation turns depends on both the researcher and the participants. Action research can be fruitful if individuals have an understandable and purposeful goal (Shani and Pasmore, 2016). Based on my observation, there were conflicting objectives that were detracting from customer satisfaction, value-creation, and efficiency at CSM Tools.

The spiral of steps shown in figure 12 (Saunders, Lewis, and Thornhill, 2015), provides the guidelines for developing a research vision, diagnosing the organization, and identifying the problem, planning actions to solve the problem, taking actions, and evaluating those within the context of the organization. Continuous reflection by the participants undergirds the actions to ensure that understanding is achieved and maintained throughout the intervention (Saunders, Lewis, and Thornhill, 2015).

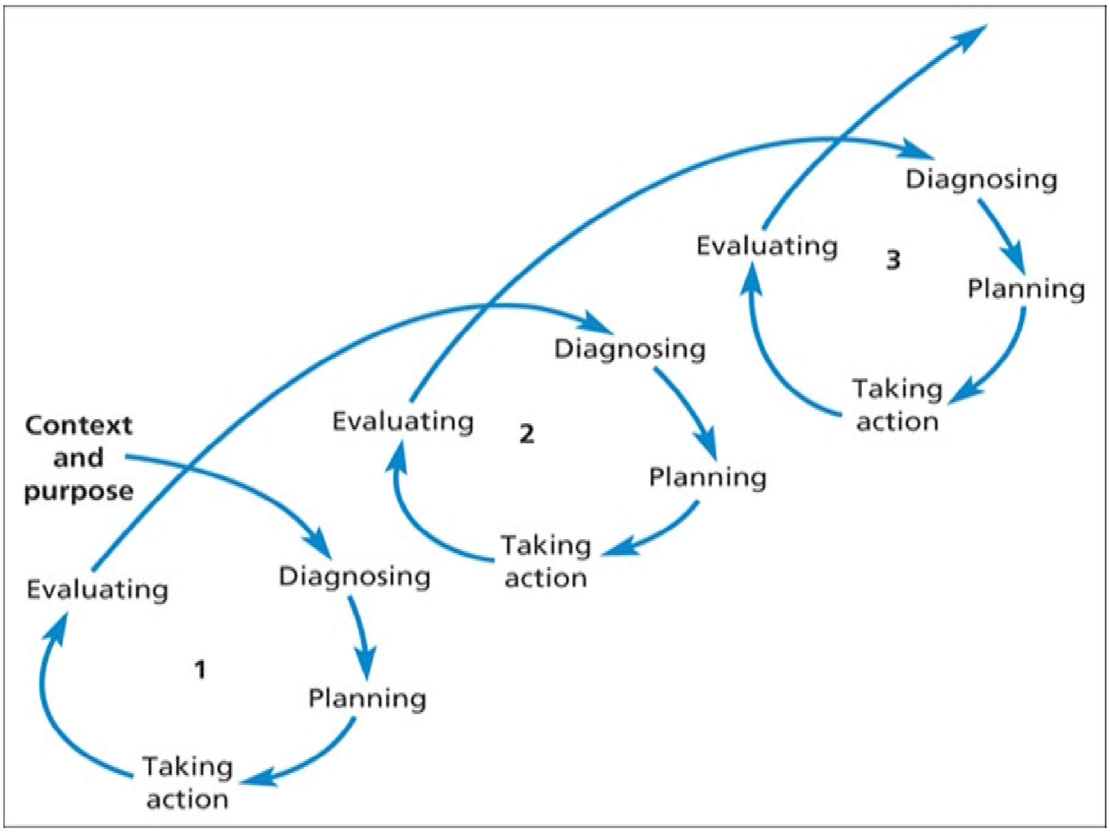

Figure 12 Action Research Spiral: Source: Saunders, Lewis, and Thornhill (2015), p. 179

In this study, the researcher saw a lack of collaboration between the finance and operations management departments and the need for the interdependent pursuit of goals between working capital and supply chain management.

Based on an initial literature review and observation of the activities and decisions made in finance and operations management, two departments to which I was familiar, I decided that the topic would concern the lack of interdependence between working capital and supply chain management activities. However, on discussing the problem with employees from the two departments, the topic was reframed to include goals. As such, the final topic became: "**Supply Chain Practices and Working Capital Theory: A Goal Interdependence Perspective.**" The main objectives at this point was to create an awareness of the need to work collaboratively towards the same goals, and to develop a sustainable social framework that could help individuals to engage more in their daily activities.

That I was an insider-researcher was important. That dual role afforded me the opportunity to invoke theory to help the organization to develop insights into the importance of departmental integration, and how beneficial this could be to the organization in terms of efficiency and worker satisfaction. A central issue in my positionality in the organization was to examine myself and my intentions relative to the intentions of the people with whom I worked. I understood what the organization and others wanted based on conversations with them, and on reading manuals and executive analyses in financial statements. The Chief Financial Officers (CFOs) were concerned with cash-to-cash cycle time, working capital, and cash flow from operations despite the fact that these measures were not part of the reporting process.

Conversely, supply chain managers were concerned with issues such as the reliability of forecasts, inventory turns, and on-time delivery. However, the underlying circumstances for the success or failure in the achievement of these metrics was not analyzed from a team perspective. Each department does its own analysis. With MMAR we aimed to expand knowledge by prudently and collaboratively drawing on the accumulated knowledge of individuals within the functions, and using various strands of data. In this case, MMAR enhances transferability of the intervention results to other contexts, an essential element of research that critics regret is not attributed to qualitative research (Creswell, 2017).

Since it was apparent that MMAR was very appropriate to investigate the research questions, and understanding the culture of independence that existed at CSM Tools, it was very important to follow the recommendations of Ivankova (2015) that in order to meaningfully carry an MMAR, the research should prudently select the participants, because participation without full engagement is meaningless action.

3.4 Participant Selection

Participants are a crucial element in action research, as their involvement differentiates action research from positivist research (Kemmis, McTaggart, and Nixon, 2014). The authors also state that the selection process can be challenging, and considering the complex nature of some of CSM Tools organizational structures, my selection process was intended to serve two crucial purposes. One was to ensure that the participants wanted to understand how working capital and supply chain management were interrelated, and the second was to see if the participants could use an understanding of the goals of the two functions to effect an attitudinal change both for themselves and for their co-workers, and to create an atmosphere of collaboration.

The selection process started in 2014, following the emphasis by management that there was a need to become more efficient because the company was facing several months of customer complaints and lost revenues. After discussing the issue with employees in the finance and operations departments, it was agreed that that was a problem in the company. We could not reach an agreement as to how to move ahead, so the problem was delimited to how working capital and supply chain management practices could be performed cooperatively to achieve efficiency and to minimize customer complaints. One employee wondered what the goals of the two departments were, and that was encouraging because I had already decided to make the subject of interdependent goal pursuit a major focus of this study.

The consent form (Appendix F) was administered to the employees, and a discussion regarding confidentiality and ability to decline then took place before the forms were completed. I assured the employees that all steps would be taken to safeguard their identities, honesty, and privacy, that they were not obligated to participate, and that they could withdraw at any time without consequences. In fact, to safeguard their identities, names were not used, and the designations were, for consistency, F for those in the finance department, and O for those in the operations department. Also, I pointed out that the Informed Consent Forms stipulate their options, what their participation entailed, the intent of the research, and the expected outcomes.

Selection of participants was mainly based on convenience and purposive sampling. Convenience and purposive sampling are used when there is uncertainty surrounding the selectivity of members within the population for one reason or another.

Convenience sampling is a form of non-probability sampling technique, by which members of the departments were selected based on their availability to participate, on the judgment of the researcher that they would contribute openly and honestly. According to Saunders, Lewis, and Thornhill (2015), convenience sampling is very suitable when the researcher wants to collect information very quickly and economically, and it also depends on the relationship of the participants with the researcher. These two principles proved very relevant in this study. Purposive sampling is used when the researcher has a plan in mind, the participants are selected because they fit that plan. In the case of this study, the plan was to establish a collaborative structure between working capital and supply chain practices, and the prospective participants had the requisite experience and knowledge that could be used to effectuate the plan (Saunders, Lewis, and Thornhill, 2015).

The sample of participants was very small for the reasons noted earlier. However, I took advantage of the opportunity to get as much information as possible. Eisenhardt and Graebner (2007) argue that the number of participants depend on availability, time, interest, and other factors, but that it was important to utilize the information to disseminate a story. Another challenge for the participant selection process was that most of the employees in the organization were not involved in action research, so it was difficult to convince them. Additionally, there was ab element of normative commitment (Allen and Shanock, 2013), where some employees believed they were important to the organization but did not feel it was appropriate to participate in the intervention. At the same time, a certain level of continuance commitment (Allen and Shanock, 2013), prevented them from participating, because they wondered what would happen if they had to unexpectedly leave the company, as some believed that age would exclude them from the workforce. Saunders, Lewis, and Thornhill (2015) argue that some individuals may express skepticism for any process that does not advance their personal careers. This explanation guided my decision to seek out participants.

As West (2012) writes, being disengaged from the situation that eventually affects you is more costly than trying to commit to interdependent action, because of the psychological impact of alienation. Participants were advised that all discussions would be entered into a notebook or journal, since they did not want to be recorded. At CSM Tools, it has been an ingrained practice that each person is ultimately responsible for his or her tasks and outcomes, and employees abided by that policy which made it challenging to secure honest participation. I nonetheless managed to get six participants who ran the course with me, and the data collection process began. The procedures are outlined in figure 11, and will start with the collection and analysis of the quantitative data.

3.5 Quantitative Data Collection and Analysis

This is an explanatory sequential mixed methods research study, with the collection of quantitative data in the first phase. The quantitative data were generated based on a paper-based closed-ended questionnaire (Appendix A) that was hand-delivered to employees in the finance and operations management departments at the start of the intervention process. There was a total of 37 employees in both departments. Considering the skepticism displayed during the pre-intervention discussion about the purpose of the study and the issues of confidentiality, I did not want to send the questionnaires via e-mail for that individuals would believe that there could be a paper-trail of their identities (Zikmund et al., 2015). The questionnaires were handed to three top executives as well. The main thrusts of the questionnaire were the goals of working capital and supply chain management, the complementarity between them, and whether employees collaborated to achieve those goals.

Nine employees and two top executives responded. Subsequent meetings were held with each respondent to advise him or her that the information was received, and how the information would be protected and used. Conversations were noted, and those formed the basis of narratives later in the study. Eventually, three employees decided to not participate, and the two executives said time did not allow them to participate, but that they would support study. Thus, six employees decided to participate. Three from the finance department, and three from the operations department, a good cross-section of personalities. To safeguard their identities, the participants were designated FIN 1 through FIN 3 for finance, and OPER 1 through OPER 3 for operations.

The closed-ended questions were appropriate in a busy environment, and were expected to be quick way to get information since the respondents only had to recognize the contents, and relate them to their current activities (Zikmund et al., 2015), and would be a primary data source for this study. Primary data are data that are collected to address the current research question. The primary data allows the researcher to control the type of information received, and to determine the direction of the research based on responses, even though the collection of primary data is more time-consuming considering the time to get the responses compared to utilizing secondary data that are readily available (Easterby-Smith, Thorpe, and Jackson, 2015).

No previous research has been done on the goal interdependence perspective of working capital and supply chain management, so no secondary data was available. However, secondary financial data were collected from CMS Tool's website and financial statements, and used to show the relationships among working capital and supply chain components, especially related to the cash-conversion cycle. Data such as accounts receivable, accounts payable, and inventory were compiled for answering the research question: "In what ways are supply chain practices and working capital theory interdependent?" from a theoretical perspective, and to show participants from both functions how the key data they were accustomed to analyzing were connected (Zikmund et al., 2015). Also, these secondary quantitative data were analyzed in reference to, and to find support for prior research, where researchers focus fundamentally on the cash conversion cycle analysis of working capital and supply chain management to determine interdependence among functional variables. These data were used to perform a correlation analysis of the supply chain-working capital nexus. Further discussion is found in Chapter 4.

The survey instrument was in the form of a 22-item closed-ended questionnaire in which employees were asked to indicate on a five-point Likert scale their knowledge of working capital and supply chain management, their goals, and the importance and capabilities to work cooperatively to achieve those goals. The scale was designed with (1 = disagree completely to 5 = agree completely).

Cronbach's alpha was used to determine the extent to which the Likert scale items produced consistent results if measures were taken repeatedly (Saunders, Lewis, and Thornhill, 2015). The values for Cronbach's Alpha vary from 0 to 1, and alpha values above 0.70 indicate sufficient internal consistency, and values over .90 are considered exceptional (Saunders, Lewis, and Thornhill, 2015). For this study, the Cronbach's Alpha is 0.97, indicating an excellent level of consistency. The results of the Cronbach's Alpha test will be discussed further in Chapter 4.

3.5.1 Other Quantitative Data: Secondary Data

The vast majority of business decisions in finance and operations management, and their associated functions, working capital and supply chain management, respectively, are based on the analysis of secondary data, where decision makers look back in history to see how certain entities or processes performed (Wetzel and Hofmann, 2019; Westbrook, 1995). Secondary data are data collected for previous studies, but they can play an important role in answering new research questions (Bell, Bryman, and Hartley, 2018). In the context of this research, and for corroborating extant research in terms of the complementarity of supply chain and working capital management, secondary data from CSM Tools' financial statements and website, were used to answer the research question: "In what ways are supply chain practices and working capital theory interdependent?" from a quantitative standpoint to show participants how the functions converge to enhance the firm performance. CSM Tools is a private company, but the financial data are easily accessed via the company's website.

Descriptive statistics of the cash conversion cycle components (days inventory outstanding, days sales outstanding, and days payables outstanding) are provided. I was responsible for the collection of the secondary data, with some employees providing data on customer order fill rate to help in the analysis of customer satisfaction. The secondary data used in this study was cross-sectional, based on several variables collected over a span of 10 years, from 2009 to 2018. Correlation analysis was performed with Excel to show how the data were aligned. These are the data with which the participants have worked, and the use of practical data provides more practical insights by way of linking the various data strands from working capital and supply chain management. Ivankova (2015) posits that by allowing individuals to utilize and evaluate the data that are a part of their everyday activities constitutes research in action.

The secondary data could prove to be a good source of triangulation for data collected from interviews and surveys (Bell, Bryman, and Hartley, 2018; Modell, 2015), as used in this study to build a more robust case for participants that working capital and supply chain management are complements rather than substitutes. As Zhao and Huchzermeier (2019) emphasize, working capital and supply chain should be treated as complements to enhance overall financial performance.

The use of secondary data confers other benefits as well. Its collections is less time-consuming because the researcher could eliminate several of the logistical obstacles (selection of participants, for example) that had to be overcome to collect primary data. Secondary data provide an unbiased opinion of users, even though one cannot guarantee the quality and structure of that data (Easterby-Smith, Thorpe, and Jackson, 2015). Fortunately, CSM Tools' financial data are audited by an external auditing firm, and this process adds to the credibility of the data.

3.6 Qualitative Data Collection and Analysis

Qualitative research has a rich legacy of research approaches that include action research whose design forms the basis of this study. The aim of the study was to examine the complementary relationship between working capital and supply chain management from a goal-interdependent perspective, in which individual perceptions were central (Lu and Tjosvold, 2013). In this mixed methods action research study, qualitative data are juxtaposed against quantitative data to generate a blend of information that could not be obtained by using a univalent approach.

Creswell defines qualitative data collection and analysis as the researcher's attempt to make sense of relevant data gathered from sources such as semi-structured interviews, observations, and documents, and then responsibly present what the data reveal. For Gehman et al. (2018) it is the systematic set of procedures that are followed to search for general yet relevant statements about relationships and underlying themes.

For this study, a semi-structured interviews were best suited to elicit the responses that were needed to explain the results of the closed-ended questions given in the quantitative phase of this explanatory mixed methods approach (Creswell and Plano-Clark, 2017). A semi-structured interview is defined as open questions that are pre-determined, but allow the participant, or even the researcher, spontaneity, and the flexibility to diverge in order to pursue an idea or reasoning for more detail (Creswell, 2017), and to explore the participants' perceptions of the complementarity and goals of working capital and supply chain management, as well as their own goals.

The interviews were done face-to-face over a three-month period due to the fact that the participants were not available sooner. Each interview lasted approximately 25 to 35 minutes. There were six interviewees or participants. Eleven employees had participated in the quantitative phase by responding to the closed-ended questionnaire. However, the two executives and three other individuals decided to not continue in the study. Selection of participants was based on convenience. As in the quantitative phase, the participants were willing and able, but as time went on, five people said they were unbale to continue.

I encouraged the participants to constantly reflect on their situations, and even though they were reluctant to have their opinions memorialized, I asked them to scribble their feelings regarding my observations of their work, and any thoughts they felt were relevant to improve work conditions, and of course, their impressions of the relationship between working capital and supply chain management. I was very mindful of their wishes to keep their work habits confidential (Eden and Huxham, 1996), and I assured them that my role was not to change how they performed their duties per se, but to emphasize the importance of performing those duties with goal and functional relationships in mind, in order to achieve greater efficiency.

Qualitative research techniques are used to discover the primary motivations of individuals within an organization, and to document patterns that require a more complete examination and exposition that could be provided by quantitative data (Creswell, 2017). The issue of goal interdependence goes beyond quantification to embrace the influential subfield of relational goals (Lu and Tjosvold, 2013) that relies on individual discipline and socialization in order to achieve organizational goals. In this context, the collection and analysis of qualitative data are required to delve into the reasons for both success and failure (Lu and Tjosvold, 2013).

One of the main problems, however, with the collection of qualitative data is that many business organizations, and individuals in particular, are reluctant to divulging, in any meaningful and honest way, information that they believe may jeopardize their well-beings (Creswell, 2017). As has been pointed out in the introduction, this was the case with CSM Tools, and which has contributed to the low participation rate in this study. In fact, Coughlan and Coghlan (2002) hint that this could also be the reason for the very slow rise in respectability of qualitative research in operations and supply chain management that are fundamentally quantitative processes.

Following the recommendation of Coghlan, and Brannick (2019), observations were interspersed among the interviewing sessions. This was done in conveniently when the participants were not available for interviews due to time constraints they experienced to complete daily projects. And it was also a way to accelerate the data collection process (Creswell, 2017). Most of the interactions between the participants and me were devoted towards convincing them of the need to participate in the intervention because, as many of them expressed, they were either satisfied with their current positions, or they were experts at their jobs, so they would contact others only when the situations warranted. I noticed that some of the participants were reluctant to show how they arrived at certain decisions, but for the sake of clarity I occasionally asked for explanations. Some responded that they "just know." When observing behavior, the subtle nuances of performance can surface, and according to Creswell and Plano-Clark (2017), observation is the most authentic means of data collection regarding organization culture, actions, and individual motivations in qualitative research, but behavior patterns could change. I received insights from Ritchie et al. (2013) who state that seeing and hearing are extremely important in observation because those senses function as the sieve in a complicated environment.

I journalized my experiences with the participants throughout the process, especially during the observation sessions, and provided constant feedback of my findings as we went along. This encouraged greater dialog that made the intervention process more amicable (Coghlan and Brannick, 2019). To build trust, I the participants were allowed to read the journal. I had to avidly take notes because participants were leery about providing recorded information. But as participants realized that they all had similar views, they became more open and communicative. Thus, the semi-structured interviews proved valuable in allowing dialog and reflection. One of the primary techniques for analyzing empirical qualitative data, such as dialog and reflexivity, is thematic analysis, the subject of the next section.

3.6.1 Thematic Analysis

Qualitative data analysis has been described as very complex and mysterious due the imprecision of some of the techniques used (Creswell, 2017), and this complexity seems to plague thematic analysis, one of the most used techniques in qualitative data analysis (Bernard, Wutich, and Ryan, 2016). Several researchers have proposed various versions of conducting thematic analysis (Bernard, Wutich, and Ryan, 2016), but this study has adopted the guides proposed by Braun and Clarke (2013). Thematic analysis entails the examination of a verbal data set, such as information from unstructured interviews, with the aim of identifying, analyzing, and reporting patterns in the data (Braun and Clarke, 2013). The researcher examines the data to select themes and to construct themes. The selection of codes and the construction of themes are basic to the study. The highlight of the study is the interpretation of the themes as they emerge from the data, and to show how they relate to the research questions (Braun and Clarke, 2013). According to Bernard, Wutich, and Ryan (2016), this could be regarded as a latent approach, where the researcher seeks to delve deeper into the underlying meanings, concepts, and assumptions that were made during the interview.

Thematic analysis is flexible enough to be used in a wide variety of theoretical and epistemological frameworks, and is especially useful in the constructivist paradigm and action research where both qualitative and quantitative techniques are merged (Braun and Clarke, 2013). Thus, it was a suitable method to use in the current explanatory mixed methods study. Thematic analysis served to deconstruct the data collected through observations and semi-structured interviews, to understand how individuals went about their daily tasks, to expand on the responses to the closed-ended questionnaire, and to see how individual relationships could be molded to enhance greater organizational efficiency. Thematic analysis could be regarded as an exploratory and explanatory tool (Braun and Clarke, 2013). In the case of CSM Tools, thematic analysis was used to delve deeper into the cultural habits of CSM Tools, and the socialization processes of the participants, and as an explanatory tool to get a more complete understanding of how individuals perceived the goals of working capital and supply chain management, as well as their own personal goals. The thematic analytical approach was suitable for getting to the heart of the research subject and context (Braun and Clarke, 2013). The authors argue that themes help the researcher to gain insights into the motivations of individuals and their responses to environmental business events.

Additionally, since the analysis of goal interdependence is guided by perceptions, planning, and motivations of individuals (Lu and Tjosvold, 2013; Deutsch, 1949), the generation and interpretation of themes are salient to understanding how individuals feel about working towards common goals.

Braun and Clarke (2013) have proposed a six-phase guide to undertake thematic analysis, but it should be pointed out that the phases are intended to be recursive rather than linear (Bernard, Wutich, and Ryan, 2016) because the researcher may need to revisit an earlier phase, probably to amend codes and themes as new data emerge. Braun and Clarke (2013) define a code as a word or phrase that captures the essence of the information given in the interview or any other form of qualitative data. Codes are the building blocks for the determination of themes. A theme is defined as any feature or pattern in the participants' interviews that answer a research question (Braun and Clarke, 2013). Themes can be identified either inductively or deductively. Using the inductive approach, the researcher can identify a theme from the current data. With the deductive approach, the researcher can identify a theme based on a pre-existing theory or framework (Braun and Clarke, 2013). Braun and Clarke (2013) point out that the inductive approach provides a broader analysis, and the deductive approach is used when the researcher wants to hone in on specific aspects of the data which could illuminate pre-existing theories or findings in the literature review. They do agree, however, that both approaches may be necessary in the research.

In this study, themes were generated inductively, but were reformulated in terms of the extant research and the research questions (Bernard, Wutich, and Ryan, 2016). I was objective enough to stand back and let the themes emerge from the data (the inductive approach), while approaching the interviews with predetermined themes based on existing theory and knowledge of the issues, and the direction in which I wanted to steer the research (the deductive approach). With the deductive approach though, I did not try to impose my beliefs on the process despite my understanding from experience and the extant literature, of the theory surrounding working capital and supply chain management, but the perspectives of the participants were foremost in the determination of the themes. The participants lead me towards that objective.

I will now outline the six phases proposed by Braun and Clarke (2013), and show how they relate to this study.

Phase 1: Become familiar with the data (Braun and Clarke, 2013, p. 87). Since the participants did not want to present written transcripts, I had to take copious notes. I was very familiar with the data presented from the beginning to the end of each interview. No transcription was necessary as in the case of individuals presenting their own transcripts to the researcher. Nonetheless, I re-read the data to ensure that all pertinent information was noted, and that I understood what the participants wanted to convey. Also, since there were only six participants I manually went through the responses as suggested by Braun and Clarke (2013), that it is much easier to work with small samples of data. To ascertain corroboration and enhance reliability, each participant was asked to review the notes I had taken during the interviews. This was done based on the recommendations of Creswell and Plano-Clark (2017) that validation is extremely important in qualitative data assessment in order to nullify the perception of researcher and participant biases.

Phase 2: Generate initial codes based on the date (Braun and Clarke, 2013, p. 87). The answers provided by each participant to the sixteen questions were reviewed for any meaningful words, phrases, maxims, and quotations (Braun and Clarke, 2013), and then cross-listed for similarity. The responses were noted in a file under the designations FIN 1, FIN 2, FIN 3, and OPER 1, OPER 2, OPER 3 (which, as mentioned earlier, were used instead of names for the participants working in finance (F) and operations management (O). Codes identify areas or issues detected in the individuals' perceptions, attitudes, and motivations (Braun and Clarke, 2013). The list of codes are given in Chapter 4.2.

Phase 3: Search for themes (Braun and Clarke, 2013, p. 87). All the data from the six participants were coded and collated**,** and many codes were generated, and will be discussed later in Chapter 4. The codes were reviewed to identify overarching themes, such as uncertainty, organizational challenges, misaligned goals, and constrained willingness. These will be discussed later.

Phase 4: Review themes, and check the relationship between themes and the codes generated(Level 1), and the entire data set (Level 2) (Braun & Clarke, 2013, p. 87). In this phase, the themes were re-examined to see if there were overlaps (Level 1). It was decided that self-interests could be subsumed into misaligned goals. Other themes such as organizational culture, collective belief, and lack of management oversight were brought up in discussions with some of the participants, but there was not enough supporting evidence, so they were discarded (Level 2) (Braun and Clarke, 2013). Participants were asked to help to delimit the number of themes, and to approve the final list of themes.

Phase 5: Define and name the themes (Braun and Clarke, 2013). In this phase, five themes were finalized and could be defined as having support from the data, and were substantive enough to support the research questions (Braun and Clarke, 2013). The final themes were uncertainty, organizational challenges, misaligned goals, and constrained willingness. The research questions relate to relationships between working capital and supply chain management, the challenges encountered in exploring the relationship between these functions, and if an understanding of goal interdependence could encourage collaboration between them.

Phase 6: Produce the report (Braun and Clarke, 2013). The task here is to tell a convincing story as revealed in the data. Validity and credibility should be central to the presentation which should be coherent and interesting, and relate to the research questions. Data extracts could help to validate the arguments put forward (Braun and Clarke, 2013).

Although thematic analysis has proved to be one of the most useful techniques in the analysis of qualitative studies, it comes with some criticisms. Creswell (2017) notes that thematic analysis does not necessarily lead to the development of theory, and can end up stating the obvious. On the other hand, he argues that when used in mixed methods research, it is a very good confirmatory tool that can help to further explain what has happened in quantitative discussions. For example, the themes that emanate from a thematic analysis can confirm the “why” of the quantitative data.

3.7 Ethical Considerations in Action Research Data Collection

Action research allows researcher and participant to coordinate their different voices, opinions, and value judgments to forge a change and future within the organization (Coghlan and Brannick, 2019), and therefore, principles of ethics should pervade every step of the intervention process ((Easterby-Smith, Thorpe, and Jackson, 2015). Because I worked alongside the participants, and the discovery and dissemination of information were related to the wellbeing within the organization, it was extremely imperative that the utmost caution was taken to ensure that the information was correct, and that all channels of collection were secured. According to Coghlan and Brannick (2019), the researcher must consider at what point research and daily work merge because there has to be a level of interdependence and also independence when it comes to organizational processes and objectivity as far as collecting information and analyzing it so that veracity is achieved and maintained. Saunders, Lewis, and Thornhill (2015) argue that the tension between the researcher and researched is abated by ethical principles that in the end will preserve the honesty of organizational change. The authors believe that it is incumbent on the researcher and the participants to uphold honesty as they co-develop the change process.

In the current study, all attempts were made throughout the research, to inform the participants and management of the research topic, the thinking behind the research, the aims and objectives, and the ethical use of the information gathered, which was primarily for research, and hence the principle of anonymity. The Informed Consent (Bell, Bryman, and Hartley, 2018) was an indication of the transparency that would be shown during the research process, and I received

"Ethics Approval" (Appendix E.) prior to the start of the research. Participants were constantly reminded that they could withdraw at any time.

I also conferred with the Human Resources department to seek organizational approval for allowing employee participation. It is very important to point out one caveat proffered by Stringer (2014), that if the participant's information is part of his daily routine, then legal authorization may be gratuitous. However, I believed that in order to prevent any unexpected eventualities, it was advisable to get the consent (Bell, Bryman, and Hartley, 2018).

At CSM Tools, for instance, action research was avant-garde, so any level of apprehension was understandable (Stringer, 2014). For evidence-based research to be a powerful component of organizational change, the evidence to address the problem has to come from people who trust the process (Stringer, 2014), and according to Shaw (2016), the establishment of ethical propriety in the gathering of information builds trust. Especially in a case where semi-structured interviews were used, there had to be an assurance that responses would be reported anonymously, and that no repercussions would come to them for participating (Stringer, 2014).

One CSM Tools' executive explained it well. She said that businesses are extremely cautious today "due to the litigious society in which they operate, and management is intolerant of behavior that exposes them to law suits." As such, all behavior is highly scrutinized. That was a legitimate concern for several of the participants, and a deterrent for others to participate. Also, the fact that the branch in which the study was being conducted was small contributed to the reluctance. I used the issue of ethics to remind myself to reflect on the relationships I had with the participants in particular, and the organization in general, and it became one of the guiding principles on which to aim for accuracy and reliability in collecting and reporting information about the company.

3.8 Chapter Summary

Table 3 Table of Methodological Actions Undertaken

Phase	Procedure	Product
Quantitative data collection	Closed-ended questionnaire sent to prospective participants via e-mail. Likert scale format. Sent to participants November 16, 2015.	Numeric data
Quantitative data analysis	Use of descriptive statistics and correlation analysis	Meaningful measures
Connecting quantitative and qualitative phases	Selection of participants using purposeful and convenience sampling methods, and interview questions development	Interview protocol
Qualitative data collection	Semi-structured interview--February 14, 2017 to May 8, 2017	Textual data
Qualitative data analysis	Coding and thematic analysis—theme development	Codes and themes
Triangulation of the quantitative and qualitative results	Interpretation and explanation of the quantitative and qualitative results	Discussion, implication, further research

This chapter provided a detailed discussion of the methodology, methods, and techniques, as well as the rationale for using the various methodological components in the study (table 3). These were supported by the relevant literature, and in concert with the participants and other employees of CSM Tools. The action research principles guided the selection of methods and techniques, and the limitations encountered within a for-profit organization in the selection of participants. Also discussed was the importance of the explanatory mixed methods research, backed by thematic analysis, to gain deeper insights into the actions, perceptions, trepidation, and belief systems that were present and pervasive in the organization. It was essential to examine the behavior of individuals as the intervention sought to get individuals in the finance and operations department, with particular reference to working capital and supply chain management, to coordinate their activities and processes to achieve greater efficiency and value, as expressed in the research questions of this study. As Stringer (2014) asserts, research context dictates the methodology.

Chapter 4: Results and Findings

4.1 Overview

This chapter provides details of the results and findings of the action research in relation to the research questions. As discussed in section 3.1, and in other sections of Chapter 3, this study utilized explanatory mixed methods research based on the recursive action research spiral (figure 12 of this study), and page 179 of Saunders, Lewis, and Thornhill (2019). And to borrow some concepts from economics, the role of action research for me was not simply as a positivist paradigm to reveal what was, but as a normative process to explain and coordinate what could or should be in terms of the coordination between working capital and supply chain management, which prior to the intervention, had been missing at CSM Tools. Saunders, Lewis, and Thornhill (2015) put it eloquently when they say that action research reveals issues and tries to correct them.

At the start of this explanatory mixed methods action research study, approximately five research questions were developed, but the primary one had always involved the interdependence between supply chain and working capital management. The other questions were then examined within the context of CSM Tools, and the resources and time that could be allotted to the inclusion of some employees in the study (Easterby-Smith, Thorpe, and Jackson, 2015). The actions to be taken involved a review of the current processes of activities in working capital and supply chain management, and to see how those could be aligned so as to eliminate duplicative activities, and to achieve greater efficiency. Also, the intervention process was aimed at creating a work environment that was conducive to knowledge sharing and human interaction.

4.2 Mixed Methods Action Research Cycle 1

Some employees from finance and operations management were approached, and the intervention aims, and processes were explained, and the search for prospective participants began. The primary objective in this cycle was to find out how much the employees know about the goals of working capital and supply chain management, how those goals intersect, the willingness to work collaboratively towards showing how those goals were interdependent, and how working towards interdependent goals could help to achieve more efficiency in operation. Hence, the closed-ended questions were geared towards getting information to answer those questions, and to be used as a foundation for further probing (the qualitative phase of the explanatory mixed methods research), which will be discussed later.

The research questions to be addressed were: 1: (the primary question: "**In what ways are supply chain practices and working capital theory interdependent?**" and 2: the secondary questions: "What challenges are encountered in exploring the relationship between working capital and supply chain management?" and "Can an understanding of goal interdependence encourage collaboration?"

The closed-ended questionnaire (appendix A), consisted of twenty-two questions, was hand-delivered to 11 employees (3 top executives, and 8 other employees) between September 2nd and 4th 2014. Those individuals had expressed willingness to participate. The responses were returned within a two-week span, but one executive and two other employees declined to respond to the questionnaire. The next section details the analysis of those responses.

4.2.1 Quantitative Analysis of Closed-ended Questions

The sample size is small, with only eleven respondents, due to purposive and convenience sampling, coupled with other organizational factors, such as time and other organizational constraints. The distribution of the responses to the twenty-two closed-ended questions (Appendix A) is displayed in Table 4.

Table 4 Distribution of Responses to Closed-ended Questionnaire

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	
0	5	0	0	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0	3	1	DC
0	3	3	3	0	0	2	2	1	0	2	3	2	3	2	1	0	1	0	0	0	5	D
0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	NA nor D
2	1	3	4	5	4	3	4	5	6	3	5	4	4	4	5	4	3	3	4	6	0	A
9	0	5	4	6	6	5	5	5	5	5	3	4	4	4	5	6	7	8	6	1	4	AC
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	

The questions were analyzed on a Likert scale ranging from 1 to 5, with one being “disagree completely” and 5 being “agree completely.” In terms of designations, DC is “disagree completely”, D is “disagree”, NA nor D is “neither agree nor disagree”, A is “agree”, and AC is “agree completely.”

Also, in this analysis, disagree completely and disagree are analyzed as "disagree" and agree completely and agree are analyzed as "agree."

Ten of the respondents agree that working capital and supply chain management are important (Questions 9 and 10). One individual surprisingly disagree, but since they were not given the option to elaborate, no explanation was given. However, this can be further probed in the semi-structured interviews planned for the qualitative phase of this explanatory mixed methods study (Creswell and Plano-Clark, 2017). One problem, however, of which I was cognizant was respondent biases (Moors, Kieruj, and Vermunt, 2014), defined as the propensity of respondents to provide careless answers. These can skew the results and findings of the research.

In fact, it should be pointed out that the executives' responses tend to reflect favorably on management, especially for questions that address cross-functional collaboration. This is exemplary of response bias (Moors, Kieruj, and Vermunt, 2014), where the responses might not be representative of the views of the general population of CSM Tools. However, Lu and Tjosvold (2013) explain that experience shows that management tends to highlight the positive aspects of the business, while even further minimizing the negatives. Additionally, the authors point out that while non-management employees tend to be honest in their opinions, it depends on the situation in which those employees find themselves, whether close to management, or they may be disgruntled with some aspects of the business operations. The CSM Tools' employees that respond to the questionnaire tend to be more honest with responses that seem to show knowledge of the functions that they perform. As Hu, Pavlou, and Zhang (2017) point out, a researcher could later develop questions that could elicit more engaging and revealing responses. That is, the researcher now invokes methodological commensurability, where a qualitative phase could ask for further explanation (Creswell and Plano-Clark, 2017), as this study is aimed to do in the qualitative phase as outlined above.

Eight respondents say that supply chain and working capital management should work together, and seven respondents agree that the functions are complementary (Q21). This number of positive responses is encouraging because it will help to positively answer the research questions for the study (Creswell, 2017). Eight respondents understand supply chain metrics, and ten understand working capital metrics. This was valuable knowledge because it could facilitate the discussion on the complementarity between working capital and supply chain management, which will be analyzed further with the use of correlation analysis.

One individual disagrees that departmental goals are clearly defined (Question 18), and three do not understand the goals of supply chain management (Question 14), while one does not understand the goals of working capital management. An understanding of the goals of both functions is pertinent because the focus of this study is on the interdependence of goals between working capital and supply chain management. On the other hand, all eleven respondents agree that collaboration is important to achieve common goals. As such, it is important to understand the goals of each function so that it will be known when those are achieved, and how they interrelate.

One important feature of goal interdependence is that people in the organization need to work together whether formally or informally to achieve common goals (Lu and Tjosvold, 2013), and from the responses, all agree that they work together informally, and only one disagrees that they work together formally. Goal interdependence refers to the degree to which individuals in the organization perceive that the goals to which they strive are common, not only in one department, but interdepartmental (Deutsch, 1949), and thus, each member of the organization should feel a sense of responsibility to pursue those mutual goals. This also builds a supportive organization that reduces selfishness, achieves efficiency, and generates individual benefits (Deutsch, 1949)

Most of the respondents agree that management encourages cross-functional collaboration (Question 3), but work constraints prevent such collaboration (Question 4). Ironically, however, six disagree that management monitors collaboration between the two departments (Question 22). Additionally, ten respondents agree that CMS Tools have the capabilities to execute intra-firm collaboration (Question 20), but it would appear that work constraints and other factors are thwarting that collaboration. This corroborates the findings of Lu and Tjosvold (2013), that management tends to formulate regulations, but as time elapses, and as people become familiar with, or even complacent in the organization, those regulations are often discarded. At the same time, however, eight of the respondents agree that they are empowered to make decisions with minimal interaction (Question 13). Three respondents disagree, however. Argyris (1998) argues that while employee empowerment fosters creativity in thought and decision making, it can cause negative reactions from individuals who prefer to eschew social interaction, which is not conducive to the inter-team collaboration that organizations need for efficiency.

A certain degree of insularity is shown in the responses to question 8, where approximately 9/11 respondents claim that individuals do not take much notice of what is happening in other departments. Ferris et al. (2015) posit that this situation may be caused by the silo mentality of individuals within departments, and also the specialized education they receive (Bennis and O'Toole (2005), which eventually lead to isolationism within the organization, resulting in underperformance by all parties (Deutsch, Coleman, and Marcus, 2014). Functional departmentalization (Coughlan and Coghlan, 2002) has survived business operations from the days of the industrial revolution, and business schools have kept the tradition intact (Bennis and O'Toole, 2005).

Employee engagement in the performance of their daily activities is vital to sustain the value that the organization aims to create (Rappaport, 1998), and it also leads to self-reflection (Coghlan and Brannick, 2019). Eight of the respondents agree that information is constantly shared between the departments, while three disagree (Question 12). Easterby-Smith, Thorpe, and Jackson, 2015). Lu and Tjosvold (2013) explain that this is not anomalous in organizations, because the information shared depends on the necessity of the information to complete tasks, and that not all information overlap instantaneously.

Cronbach's Alpha, whose parameters are discussed in section 3.1 above, was used to assess the reliability and internal consistency of the survey instrument. An alpha score of .97 was determined in the calculation below, indicating a strong reliability and consistency of the five-item scale used to assess the participants' perceptions of the interdependence between functional goals being researched (Saunders, Lewis, & Thornhill, 2015).

$$\textbf{Cronbach's Alpha formula: } \left(\frac{K}{K-1}\right)\left(\frac{S_y^2 - \Sigma S_i^2}{S_y^2}\right)$$

$$\textbf{which is: } \left(\frac{22}{21}\right)\left(\frac{1566.24-112.32}{1556.24}\right) = \mathbf{0.972010}$$

K is the number of items in the questionnaire (22), S_y^2 is the variance of the total observed test scores, and ΣS_i^2 is the sum of the variances of the individual test items.

4.2.2 Qualitative Analysis of Semi-Structured Interviews

An explanatory sequential mixed methods study consists of two phases: the quantitative phase followed by the qualitative phase. We will not turn to the qualitative phase to get greater depth and scope into the participants understanding of the interdependence between working capital and supply chain management, and to determine how the two departments could move closer to collaborating on mutual goals.

I, with contributions from three of the participants from the operations management team designed a semi-structured questionnaire (Appendix B) based on ideas from the literature review and some of the unexpected responses to the closed-ended questionnaire. The responses from the closed-ended questionnaire were anonymized, so there was no possibility to violate the confidentiality to which the participants and I had agreed. For the closed-ended questionnaire, N = 11, but for the semi-structured interviews, N = 6, so the sample size is even smaller. As was mentioned earlier, the two executives and three other employees decided to withdraw their contributions to the research. There was an even cross-section of participants. Three from the finance department, and three from the operations department. The range of employment for the six participants with the company was from 4.5 years to 25 years, with finance participants averaging approximately 19 years, and operations participants averaging approximately 12 years.

The following are synopses of the lengths of time the participants have been with CSM Tools, and their views of the culture and expectations of the company, as well as their own experiences. This background information is important in thematic analysis, how employees see themselves within the context of the organization (Creswell, 2017).

> FIN 1: This employee has been with CSM Tools for 25 years, and his main goal was to "work to maintain a family." He had been moving from job to job, so to last 5 years in one place was an accomplishment, and "I do not intend to upset the applecart."

> FIN 2: She has been with the company for 15 years, and has experience working as a financial analyst, and in accounts receivable. Her main goal was to work as hard as possible, and to "do what it takes to move ahead."

FIN 3: She has been with CSM Tools for 18 years, and "is willing to work with others to be more efficient." She believes the "goals of the company should be important to everyone since the success of the company is our success."

OPER 1: He has been at CSM Tools for 23 years. He notes that "we are very relaxed here, and management leaves us to do a lot of the decision making, especially if you are here a long time. We are highly specialized, and our responsibilities are somewhat personal."
OPER 2: He has been with the company for 4.5 years, and "I like to know what others are doing in my department, and the people in the department are close." His main goal is 'To respect the roles of others, and let them perform."

OPER 3: 9 years with the company, this employee has "seen a lot of people come and go." "If you do not know what you are doing, you will be lost, because management expects you to know your job."

The above highlights encapsulates the culture of the organization, and one of the reasons it was challenging to get participants because individuals have certain idiosyncrasies that are inform the goals to which they strive (Porter, 1998). These perspectives give us some reasons for some of the surprising responses to the closed-ended questionnaire.

The interviews took place between February 14, 2017 to March 8, 2017, and each lasted between 25 and 35 minutes. The length of time was based on the availability of the participants. One of the principal aims of this study, apart from pointing out the interdependence between working capital management and supply chain practices from a quantitative perspective, was to understand the role of human behavior in influencing the degree to which change can be effective in the organization (Coghlan and Brannick, 2019). In the case of this research, we wanted to understand the extent to which the attitudes and perceptions of the participants could affect the achievement of mutual goals between working capital and supply chain management.

4.2.3 Thematic Analysis of the Semi-Structured Interviews

As Braun and Clarke (2013) recommend in phase 1 of their framework, I made sure to familiarize myself with the information provided by each participant, so that I would be able to find both similarities and differences in their perspectives. We wanted to dig deeper into the participants' views, opinions, experiences, and knowledge of the relationship between working capital and supply chain management, the interdependent goals between the functions, as well as how individual goals related to overall organizational goals. The interview data of the six participants were examined several times, and the coding process began.

Coding

The generation of codes is the second phase of thematic analysis (Braun and Clarke, 2013), where interesting features of the interviews were identified and set apart as relevant to the research questions. Codes are markers used to identify important words, sentences, or paragraphs, provided in an interview or other qualitative technique (Braun and Clarke, 2013). An initial list of nineteen initial codes is given in table 6. Codes such as time consuming, workload, time constraints, uncertainty, and lack of commitment to too many things were deductively determined since I have had informal dialogs with employees, and I understood some of their views, and some of the interview questions were geared towards getting those responses (Braun and Clarke, 2013).

However, others such as "could socialize more," "could collaborate more," and "teamwork is good but sometimes it's best to work alone" were inductively determined as the interviews unfolded. The coding was done manually, so several repeated phrases were highlighted. The list of codes was presented to the participants who expressed satisfaction with the selection. This was one way of achieving validity and trustworthiness (Braun and Clark, 2013). From the list of codes (table 5), certain themes were generated. The coded data can be combined to form potential themes (Braun and Clarke, 2013). Some overlap in themes was noticed, and an overarching theme was determined in order to delimit the number of possible themes (Braun and Clarke, 2013).

Table 5 List of Codes Generated from Interview Data

Codes
Uncertainty
Like to work alone
Cross-functional relationships
I understand my role, not anyone else's
Each department has its own goals
Time-consuming
Satisfaction with current responsibilities
Time constraints
This is just a job. Cannot commit to too many things
Team work is good but sometimes its best to work alone
Lack of trust
Could collaborate more
I do not work with working capital
When I know what others are doing I feel better
Misunderstanding of workflow
Could socialize more
Workload
My goal is to work 9 to 5 and then go home
Make money within a short time

As noted earlier, other themes such as organizational culture, collective belief, and lack of management oversight were brought up in discussions with some of the participants, but there was not enough supporting evidence, so they were discarded. The discussion with the participants also helped to delimit the number of themes, and to approve the final list of themes. After much distilling of the data, the final themes were uncertainty, organizational challenges, misaligned goals, and constrained willingness. Figure 13 displays the proportion of responses in terms of themes.

Codes		Themes	Codes	Statistics	
Uncertainty	U	Uncertainty	U	Frequency	
Like to work alone	MG	Organizational challenges	OC	Uncertainty	3
Cross-functional relationships	OC	Misaligned goals	MG	Organizational challenges	5
I understand my role, not anyone else's	MG	Constrained willingness	CW	Misaligned goals	7
Each department has its own goals	MG			Constrained willingness	4
Time-consuming	OC				
Satisfaction with current responsibilities	MG			Total	19
Time constraints	OC				
This is just a job. Cannot commit to too many things	MG			Proportion	
Team work is good but sometimes its best to work alone	CW			Uncertainty	16%
Lack of trust	U			Organizational challenges	26%
Could collaborate more	CW			Misaligned goals	37%
I do not work with working capital	MG			Constrained willingness	21%
When I know what others are doing I feel better	CW				
Misunderstanding of workflow	U				
Could socialize more	CW				
Workload	OC				
My goal is to work 9 to 5 and then go home	MG				
Make money within a short time	OC				

Figure 13 Statistical Display of Codes Transformed into Themes

The theme of misaligned goals was strong during the interviews, where participants seemed to concerned with other objectives, for example money and specific departmental goals, but not with mutual goals, and especially weak was coordination between functions. It shows that the organization has some challenges that are preventing the alignment of goals, and management has stated that "one goal of CSM Tools is to pool resources to strengthen our customer relationships and our competitive bases." (CSM Tools 2018 Financial Report, p. IV). Nonetheless, some of the participants, express willingness to collaborate for the good of the company, but they were uncertain how to go about doing that. These will be further discussed, with participants' statements in the sections on the themes.

The following sections look more closely at the important themes that emerged.

1. Theme of Uncertainty

Despite the popularity of the term supply chain in business, a great deal of uncertainty surrounds its actual role and goals in the organization and in the generation of profit. OPER 1 noted that "many employees regard supply chain as delivery." Wetzel and Hofmann (2019) point out that this is an anachronistic view that has not evolved commensurately with the evolution of supply chain practices. The view of OPER 1 helps to answer the question of the relationship between supply chain and working capital, because if individuals do not understand supply chain practices, they will not understand, neither can they explain the goals of supply chain management. All the participants claim that the boundary between functions "make it sometimes difficult to learn what others are doing." FIN 2, who has been with the company for 15 years, said she was "not sure if she was expected to do certain things on her own, or ask others to speed up the process." In fact, she had no experience in supply chain management, so she was not sure what actions to take for certain supply chain processes.

According to Chaudhuri, Boer, and Taran (2018) a lack of awareness of supply chain practices has caused several supply chain interruptions. Zhao and Huchzermeier (2019) argue that the supply chain is the reflection of finance and vice versa. So, for FIN 1 for example, working only on financial matters is not helping to prevent issues that could impact the entire organization.

Two of the participants from the finance department mentioned the term "not sure" six times, or "it should be important" regarding the role of the supply chain. This shows the uncertainty they had about the goals of supply chain. FIN 1 frankly shared his opinion of the relationship between supply chain and working capital in this manner: “I am not really concerned about how they do their job. Everyone has a job to do, they need to do it well so that we will all be successful.” But success, according to West (2012), is more assured when the organization works as a team, with everyone showing interest in how processes are executed because the end result is a reflection on everyone. As Deutsch (1949) puts it, the pursuit of goal interdependence is predicated on the pursuit of knowledge.

2. Theme of Organizational Challenges

According to OPER 2, “Management is interested in making money and there is no time to get involved in other activities.” The objective of shareholder value maximization has been the primary objective of the firm (Rappaport, 1998), it has presented challenges for the organization because some firms do not know how to balance this objective and other objectives (Wetzel and Hofmann, 2019; Bennis and O’Toole, 2005). CSM Tools faces multi-faceted and complex issues, for example, high levels of attrition, as OPER 3 noted earlier that he has seen many employees “come and go” and this is undesirable to maintain stability in human capital. In this case, employees who stay with the company are burdened with picking up the slack, especially when the workflow is at times unexpectedly too much,” so, as OPER 3 points out, “it is difficult to engage in activities that are outside the daily activities, such as cross-training.” It must be pointed out that the CFO of the company resigned at the end of 2019, adding to the problem of attrition just mentioned.

FIN 2 explains that “there is not much time for innovativeness, and tasks are basically routine.” FIN 2 continues: “management expects everyone to come to the job with the knowledge to complete our tasks,” a situation that Porter (1998) terms functional competencies in business. This level of competence is required by all firms, but the challenge it poses is that individuals are pigeonholed into skill sets that often do not require them to learn what others do (Porter, 1998).

According to Lu and Tjosvold (2013), one of the serious challenges facing modern firms is how to make knowledge complementary in a society with such specialized and differentiated knowledge systems. This view is in line with the challenge of this study to attain complementarity between functions that are theoretically different. CSM Tools needs to foster cross-functional relationships, but time and work constraints are posing challenges. OPER 2 alludes to the problem of having to complete certain tasks within specified timelines, and "we cannot commit to anything outside of those activities."

In a management expose on the operations of the firm, noted in CSM's 2019 Financial report, there are numerous risks and challenges that the company faces, including potential loss of key employees and customers, difficulties in managing a geographically-dispersed company, deficient controls over supply chain issues, and the problems management faces in addressing the various issues that come up expectedly and unexpectedly. As FIN 2 explains in her experience, there have been "increases in company expenses, and working capital requirements, which have reduced the company's return on invested capital." Nearly all the participants express the desire to make money as quickly as possible, for the company and for themselves, and the importance of revenue generation "excludes things like socializing" FIN said. The challenge for any firm, according to Kaplan and Norton ((1992), is the ability and willingness to balance the need for social interaction while working efficiently, and generating the level of income that shareholders demand.

FIN 1 said "it is particularly challenging to manage financial transactions with customers who are facing financial problems themselves. In this case, we cannot manage financial customer relationships." To this I probed him more by asking "can you not do both because the management of one can facilitate the management of the other?" He retorted "Marketing should manage customer relationships." This view is exactly what Lu and Tjosvold (2013) believe to be one of the major challenges of the organization. Individuals do not want to move outside their major fields to learn new knowledge. Knowledge seems to be specialized, where marketing is tasked with customer relationship management, and finance deals with sources and uses of funds. While this presents a challenge for CSM Tools, it also shows how misaligned functional goals are. This theme will be discussed next.

3. Theme of Misaligned Goals

Every organization understands the importance of the goals that they set, whether organization-wide, functional, or departmental (Porter, 1998), and the implementation and achievement of those goals depend on organizational personnel and culture, and resources (Wetzel and Hofmann, 2019; Lu and Tjosvold, 2013; Rappaport, 1998). In fact, Porter (1998) believes that the setting and achievement of goals are a cognitive process because they provide employees with a challenge to pursue and accomplish those goals, and there is a feeling of accomplishment in the end when those goals are achieved, and conversely, a feeling of defeat when the goals are not met. It is, therefore, incumbent on management to ensure that there is collaboration in terms of what those goals signify for everyone concerned (Porter, 1998).

This study was aimed at achieving an alignment between the goals of working capital and supply chain management, and what Porter (1998) and others have stated is pertinent here. There are goals set for supply chain practices, for example, short cycle time (the average time to process and ship an order from the time it is placed to the time it is delivered), the maintenance of high-quality customer relationships, operational efficiency, and contributing to the organization's financial performance (Wetzel and Hofmann, 2019). On the other hand, there are working capital management goals, for example, strengthening the firm's liquidity position, shortening the operating cycle (average days to receive inventory, sell that inventory, and receive payment from the sale of that inventory), and helping to manage the firm's cost of capital. These are just a few of the goals of supply chain and working capital management, but as will be further explained through the use of the cash conversion cycle (CCC) (the average days for the company to convert inventory into cash receipts), these are aligned goals that should be pursued by both finance and operations management.

It was not encouraging to realize during the interviews that job performance was split right down the middle between finance and operations management. Finance specialists preferred to leave supply chain issues to operations management, and vice versa. OPER 1 said that "I understand that both departments are working for the benefit of the company, but they have to do their job, and we do ours." On the other hand, FIN 2 expressed the view that: *'We should understand supply chain issues, because I have received customer complaints that I should be able to address, but I turned them over to someone in operations."* Notwithstanding the cognition that both functions are responsible for organizational goal attainment, the participants seemed willing to remain bound by their job descriptions. Blome, Schoenherr, and Rexhausen (2013) hint at this silo effect, noting that management desires collaboration in the pursuit and achievement of goals, but individuals seem to veer from that understanding. The authors believe that management should insist on a collaborative approach and objective.

FIN 2 earlier referred to the lack of innovativeness, and this could be ascribed to the unwillingness of the two departments to work together in a concerted manner. Wetzel and Hofmann (2019)note that the problem organizations encounter in trying to integrate the supply chain supply and to prevent supply chain interruptions rests on the problem of creating a business culture in which individuals have the initiative to get beyond their current stations and do things that benefit the firm as a whole. In fact, OPER 2's view is revealing. In response to the question "Do you believe cross-functional cooperation is important in the organization? (Explain)," she said; "Yes, but why should I care if I am not being paid to do more." Understandably individuals should be compensated commensurate with their level of work. However, by not being willing to collaborate, certain goals of the firm will not be met, and that poses problems for both the organization and the employees. Wetzel and Hofmann (2019), Lu and Tjosvold (2013), and Porter (1998) argue that individual goals are not the recipe for success, but that collaborative goals make an organization stronger and more competitive.

Christopher (2016) notes that strategic supply chain practices are conducted within the parameters of cross-functionality to minimize the complexity, and to account for the multidimensional nature of business today. However, functional misalignment tends to be too prevalent in organizations, and has provided evidence of organizational failures. According to OPER 1, who lived through the financial crisis at the company, notes that “CSM Tools had problem during the financial crisis because we did not understand the environment, and we were not advised by finance what was happening with the financial downturns our clients were experiencing.” Zhao and Huchzermeier (2019), Hofmann and Kotzab (2010), and Richards and Laughlin (1980) show that organizations that align finance and operations, and more specifically, working capital and supply chain management, are much more successful in both the short-term and long-term because they are better equipped, not only financially, to navigate uncertainties in the business environment, but in terms of personnel to devise cross-functional strategies to combat those uncertainties.

The goal conflicts between working capital and supply chain management have been amply noted in the literature (Zhao and Huchzermeier, 2019; Richards and Laughlin, 1980), and the problem of cross-functional collaboration (Tsai and Hsu, 2014), yet many organizations are failing on an intramural level (Christopher, 2016). OPER 3 expresses doubt that “we will ever reach the point where one individual can do the job of finance and operations.” This signals the unwillingness to learn to do other jobs, and at the same time a belief that the organization can survive with highly specialized functions. Christopher (2016) notes that in upstream supply chain, individuals of diverse educational and experiential backgrounds such as purchasing, marketing, research and development coordinate to deliver goods and services, but it is often on the downstream end that there is functional misalignment. With customer as a primary goal for the firm, departments should be more coordinated (Christopher, 2016).

In fact, as pointed out earlier, FIN 1 was not really concerned about the duties of operations specialists, and OPER 2 believed that by working from "9 to 5" he was accomplishing his tasks.. Such an attitude detracts from goal achievement because the individual is circumscribing himself within a timeframe that may be negative to what the firm needs to succeed. Ironically, he has been able to perform this way for 25 years. As Oliva and Watson (2011) argue, this is really a reflection of the behavior that has been allowed to take root, without managerial oversight, as well as an expression of the ignorance of how the overall goals of customer satisfaction should be accomplished. On the other hand, this embedded culture makes the pursuit of change, and the undertaking of action research even more challenging (Coughlan and Coghlan, 2002).

4. The Theme of Constrained Willingness

One of the latent themes that emerged from the interviews, but which is particularly important in the discussion of goal interdependence, is the willingness of individuals to coordinate, but they are constrained by issues in the organization, from workloads to timing to organizational culture. Many of the participants expressed the willingness to socialize and work cross-functionally, their work schedules did not permit those actions. As Deutsch (1949) explains, the willingness of individuals to do what is best for the organization, as well as the recognition that their goals are aligned with those of others or the organization, is a positive sign. OPER 2 expresses the desire to learn what others are doing, but believes it is "best to leave them alone" because "some people do not like to be bothered." FIN 2 and FIN 3 expressed similar feelings of "need to socialize more" because "this makes the day moves faster." And OPER 1 believes that "finance and operations could coordinate more, but we do not have the time. There is a lot of work."

All participants claim that they "all want to achieve the same goal of job satisfaction," but they had to be prompted to align that goal to overall organizational goals, and the goals of the functions in which they worked. They agreed on what work quality and standards were, but that was not a regular consideration. It was more a tacit understanding than a regular discussion point. OPER 2 noted that "if the level of performance and quality of work is not reached, sometimes the supervisors would have a meeting with the parties concerned. They all seemed to believe that turnover rate of new employees contributed to the seldom intervention by the supervisors, because they themselves had to do more than they their usual tasks.

Lu and Tjosvold (2013) argue that willingness to perform in the organization could mediate achievement and stress. Employee engagement, defined as the commitment of the employee to the objectives of the firm, is a key ingredient for goal attainment (Deutsch, 1949). As FIN 3 points out, the goal of the company should be everyone's concern, and FIN 2 planned to work as hard as possible to advance in the company. Porter (1998) posits that it is the role of management to know the personnel so that the individuals who are willing to achieve the firm's goals are not dissuaded by the limitations of the organization.

A discussion of the findings from Action Cycle 1 was held with the participants, and they were encouraged to continuously reflect on the activities through which we had just gone (Saunders, Lewis, and Thornhill, 2019), and the actions to be taken to improve the situations about which they expressed concerns.

In keeping with the suggestions of Ivankova (2015) that by allowing individuals to utilize and evaluate the data that are a part of their everyday activities constitutes research in action. At the same time, Creswell (2017), and Coughlan and Coghlan (2002) also suggests that pragmatism adds a certain level of interest that is long-lasting.

4.2.4 Discussion

A triangulation of the quantitative and qualitative data finds that participants were willing to engage in mutual goal pursuit between working capital and supply chain management, but they were unsure of how to go about it, and the there was no real push to do it, so they shelved the idea. One major problem discovered was that the participants believed that work constraints and organizational structure in terms of how functions were structured, prevented them from interacting, and exchanging knowledge. At the same time, there was not much management oversight to ensure that activities were being coordinated in order to enhance efficiency.

The findings from the open-ended semi-structured interviews show that individuals would use several methods to cope with their situations, including dealing with individuals within their own departments, and not being proactive in helping other departments to solve issues. If a certain problem existed within the finance department, operations personnel would wait for finance to fix the problem, and vice versa, and that would result in loss of efficiency, slow customer response time, and low customer order fill rate, as one participant expressed.

Both qualitative and quantitative investigation reveal that any attempt at goal interdependence requires the behavioral competencies, as well as knowledge of the goals of both functions. 8/11 understand the supply chain management goals, and 10/11 understand working capital goals, but one of the main findings was that the participants did not take those goals into consideration when performing their daily tasks. When asked the reason for the discrepancy between knowledge and actions, the participants expressed disinterest in trying to focus on goals.

This supports findings by Deutsch (1949) and Lu and Tjosvold (2013), that individuals may not willingly express interest in a certain activity or process if the context does not warrant it at the time. The authors express that management has to become more active in reminding people what the end goal is. Otherwise, actions merely become a habit, which may at times be independent, meaningless, ineffective, and leads to inefficiency (Deutsch, 1949).

One of the primary manifestations of mixing research methods is that the study prioritizes the research questions over the debate on epistemology and ontology (Creswell, 2017). Whatever means are necessary to reach a reasonable answer to the research questions should take precedence over other methodological concerns (Creswell, 2017). In this case, the qualitative phase provided some profound revelations as to the challenges facing CSM Tools in working towards goal congruence. The quantitative phase laid the groundwork that there were challenges, especially in a context where it was difficult to get relevant information (Coughlan and Brannick, 2019). As determined in the by the thematic analysis, 63% of the issues facing participants rest on misaligned goals and organizational challenges.

Having reflected on the findings and actions taken in cycle one, it was determined that the answers to two of the research questions began to take shape at this point: (1)Can an understanding of goal interdependence encourage collaboration? And (2) What challenges are encountered in exploring the relationship between working capital and supply chain management? Based on the information gathered the simple answer to both questions is “yes.” But these will be expanded in Chapter 5. The answer to one of the questions 1: “In what ways are supply chain practices and working capital theory interdependent?” however, needs the collection of some secondary data, which will be done in the next action research cycle.

4.3 Mixed Methods Action Research Cycle 2

In this cycle, to generate further interest, and to demonstrate to the participants the practical nature of the relationship between working capital and supply chain management, information with which the participants worked on a daily basis would need to be collected. And based on the workload and time-constraints concerns expressed during the interviews, I decided that the collection of the secondary data from the company's financial statements and other sources would be my responsibility, and that for other required information which I may not be able to access I would request help from the participants and others, under strict confidentiality.

The first decision in the phase was to introduce to the group the Shewhart's (1931) cycle of continuous improvement that came to be widely known as the Deming Wheel, as it was redesigned and popularized by Deming (1994) as the PDCA (Plan, Do, Check, Act) Cycle (Figure 14), similar to the dialectic action research spiral proposed by Mills (2003), in which a problem is

Figure 14 Deming's System of Quality Improvement Analysis (Deming 1994, p. 11

found, data are collected, analyzed, and interpreted, and an action plan is developed to address the problem. The Deming Wheel has been frequently cited by the operations department, so it was a good strategy to show the finance specialists a model that resonated with management, and whose features lend themselves to collaborative problem-solving, which is the core of action research.

As discussed in Chapter 3, secondary data are sometimes necessary in the current study to further develop the research questions, and to contextualize the study in a practical way ((Bell, Bryman, and Hartley, 2018; Modell, 2015). This indicates that the study tries to include the daily events as they occur in the organization, and that the data collection and analysis are embedded within the current process, and linked to the extant literature (Coughlan and Brannick, 2019; Coughlan and Coghlan, 2002)

4.3.1 Collection and Analysis of Secondary Data

The main responsibilities in working capital management at CSM Tools include credit analysis, financial analysis, accounts receivable, accounts payable, order fulfillment, and demand planning. The main responsibilities in supply chain management include inventory management, delivery, returns, upstream (supplier) relationship, downstream (customer) relationship, and the formulation of supply chain strategy. According to Zhao and Huchzermeier (2019), Christopher (2016), and Hofmann and Kotzab (2010), the relationships among these activities are critical for preventing supply chain interruptions and for the survival of the firm.

It took one week to get the financial information because the financial statements were readily available. We met following every month-end closing activities for two months, January and February of 2018 to discuss the information. This was important because it added a level of relevance and currency to the research. Saunders, Lewis, and Thornhill (2015) contend that action

Table 6 Descriptive Statistics of CCC Relationships

Statistics	*Days to Pay*	*Days to Collect*	*Days in Inventory*	*CCC*
Mean	28	50	108	130
Standard Error	1	2	3	3
Median	28	50	111	132
Standard Deviation	4	6	10	10
Sample Variance	16	34	97	95
Range	14	19	33	35
Minimum	19	41	83	105
Maximum	32	60	116	140
Sum	279	504	1078	1302
Count	10	10	10	10

research is an interactive process as participants see themselves connected to the moment and to the responsibilities of others. Deutsch (1949) argues that goal interdependence is more attainable when evidence is in the presence of the team members.

The primary nexus among these activities is the cash conversion cycle (CCC) (Zhao and Huchzermeier, 2019; Hofmann and Kotzab, 2010; Richards and Laughlin, 1980). CSM Tools purchases inventory (upstream activity), holds it for a period of time, then sells it to customers (downstream activity) for cash. This conception of the CCC relates to CSM Tools. Richards and Laughlin (1980) refer to this as the working capital cycle. On the recommendation of Wetzel and Hofmann (2019), and Richards and Laughlin (1980), data on the main components of the CCC were collected and analyzed. Those data were days inventory outstanding (DIO), days sales outstanding (DSO), and days payables outstanding (DPO). The CCC is calculated as DIO + DSO – DPO). Working capital management is a significant aspect of cash flow management, which is closely tied to the successful operation of the supply chain (Kroes and Manikas, 2014; Hofmann et al., 2011). The fact that some of the participants were responsible for working capital activities, it was relevant to quantitatively show the relationships among those components of working capital and supply chain management. Hence, we needed to collect data on all three components.

The mean CCC for CSM Tools over the period studies was 130 days, because the DIO was large at 108 days (Table 6). The 130 days far exceed the industry average of 97.6 days. Participant FIN 2 commented that "these things have never been pointed out, not to me in any case." Researchers point out that DIO indicators involve several factors, chief among them are economic factors that take in demand for the products and services. In fact, between 2009 and 2013, when the economy was just emerging from the financial crisis, average DIO was 113 days, compared to 2017-2018 when it fell to 108 days. The difference of 5 days could be important for working capital depending on the dollar value of the items (Shin and Soenen, 1998). The working capital policy, therefore, would be to shorten the DSO and extend the DPO. Currently, MSC is paying its suppliers within an average of 28 days compared to an average of 50 days to receive payments from customers. It is for this reason that the company has been falling short of the working capital target of $827M annually (2017 Financial Report, p. 83).

However, as researchers (Zhao and Huchzermeier, 2019; Hofmann and Kotzab, 2010; Richards and Laughlin, 1980) argue, a shortened DSO, and an extended DPO may impact customer relationships. But it would take coordination between supply chain management and finance to determine the best policies to implement (Hormann and Kotzab, 2010).

The concept of the CCC was explained to the participants to ensure clarity of purpose. However, those in finance were aware of the concept, but were not sure how it worked in practice. According to FIN 1, "I learned the concept in financial management, but I have not used it since."

Other data collected were: working capital; turnover ratios (receivables, inventory, payables) to determine the efficiency with which CSM Tools manages its assets (Deloof, 2003;

Richards and Laughlin, 1980); and customer order fill rate, an indicator of customer satisfaction (Tan et al., 2017).

The main financial data compiled from the financial statements are presented in Appendix C, and the correlation analysis is presented in table 7.

Table 7 Correlation Matrix of CCC Components and other Data

Variables	*Days Inventory Outstanding (DIO)*	*Days Sales Outstanding (DSO)*	*Days Payables Outstanding (DPO)*	*Cash Conversion Cycle (CCC)*	*Customer Order Fill Rate*	*Working Capital*	*Payables Turnover*	*Receivables Turnover*	*Inventory Turnover*
Days Inventory Outstanding (DIO)	1								
Days Sales Outstanding (DSO)	-0.544887	1							
Days Payables Outstanding (DPO)	0.36699441	0.15056521	1						
Cash Conversion Cycle (CCC)	0.15604542	0.63602612	0.0129028	1					
Customer Order Fill Rate	-0.4575005	0.60467111	-0.4624478	0.568948	1				
Working Capital	0.22107233	0.10842101	0.2384474	0.2439555	0.1764	1			
Payables Turnover	-0.3414187	-0.1962249	-0.9975509	-0.046639	0.42888	-0.279	1		
Receivables Turnover	0.49943609	-0.9892653	-0.2048688	-0.639596	-0.58488	-0.1753	0.2506	1	
Inventory Turnover	-0.9994865	0.55010455	-0.3660981	-0.149139	0.46552	-0.2219	0.34138	-0.5062267	1
		P-value ≤ .05 is staatistically significant							
		P-value > .05 is not statistically significant							

Based on the Pearson coefficient of .05 level of significance, working capital is positively related to DIO, DSO, and DPO, which means that an increase or decrease in any of those CCC variables will respectively decrease or increase working capital. It is worth pointing out also, that working capital is positively correlated with the CCC and fill rate. This is significant for the company because a low fill rare signifies slow moving inventory which will not generate enough working capital to fund current operations, and the CCC is affected. according to Deloof (2003), the level of working capital affects inventory turn that impacts supply chain performance and the financial performance of the company.

Deloof (2003), and Richards and Laughlin (1980) argue that the working capital policy of the firm impacts the outcomes of the relationship among DIO, DSO, and DPO. That is, a firm can delay payments to its suppliers if management realizes that there is a shortage of working capital, and management can request faster payments from customers to ensure an adequate flow of working capital. Hence, as the authors argue, sometimes there will be relationship outcomes that defy logic.

The importance of the intersection between the working capital and supply chain management is clearer when the link between the balance sheet and income statement is made (Wetzel and Hofmann, 2019; Wisner, Tan, and Leong, 2014). The DIO = [(inventory/cost of goods sold)*365], DSO = [(accounts receivable/sales)*365], and DPO = [(accounts payable/cost of goods sold)*365]. This shows that the CCC components are closely tied to the inventory management and sales that undergird financial performance. According to Richards and Laughlin (1980), no part of the business is isolated, and organizational and operational holism is an essential part of financial performance goals.

The matrix results were explained to the participants in two sessions because not everyone was available for one presentation. The correlation coefficient range from -1 to +1. Negative one is perfectly negative correlation, and positive 1 is perfectly positive correlation. A positive coefficient does not mean a greater correlation than a negative coefficient. The signs indicate whether the variables move in the same direction (positive) or in opposite directions (negative). The important thing is to recognize that the variables are correlated and the interpretations. Researchers in practice are usually accepting of coefficients of 0.5 or higher (Zikmund et al., 2015). OPER 1 expressed that “it is good to know that we can see how the different elements come together.” FIN 2 exclaimed “I have never thought about those relationships before.”

One employee who was not one of the participants provided an average of the customer order fill rate calculated by dividing the number of orders filled and shipped from available inventory by the number of customer orders placed. I pointed out to the participants the positive relationship between customer order fill rate and working capital. That is, as the fill rate goes up, working capital increases. Thus, it is important to understand management's insistence on increasing the fill rate. Hofmann et al. (2011) argue that the fill rate is directly related to the firm's level of cash flow. In fact, FIN 2 had earlier expressed the view that: "We need to understand supply chain actions, and what they do." Now he added: "whenever customers receive the wrong order, it messes up the customer relationship that is related to fill rate."

Table 7 provides a benchmark for customer order fill rate within the manufacturing, repair, and operations industry in which CSM Tools operates. CSM's average over the 10-year period studied was 92.56%. Based on the benchmarks set by Tompkins Supply Chain Consortium Benchmarking and Best Practices tool (https://www.tompkinsinc.com/en-us/) CSM Tools fell in the competitive advantage profile (Table 7). The company had a 97.50% target, which was above the 92% - 98% rule of thumb established by Tompkins.

Table 8 Customer Order Fill Rate Benchmark (Tompkins.com)

Quartile	**Percentage**
Leaders (top quartile)	>=98.0%
Competitive Advantage (second quartile)	>=96.0% and <98.0%
Competitive Disadvantage (third quartile)	>=92.0% and <96.0%
Opportunity (bottom quartile)	<92.0%

Possibly there could be a coordinated effort between finance and operations to determine what issues are preventing the company from achieving its target (Tan et al., 2017). At the same time, the fill rate is positively correlated with the CCC, and as Deloof (2003) finds, this combination drives company performance, because as the fill rate increases, it boosts the performance of the CCC.

Two of the fundamental issues that emanated from the interviews were the need for coordination between the finance and operations personnel, and the establishment of a more relaxed environment where collaboration can be facilitated. However, based on the personnel issues that the company has in terms of the unfavorable attrition rate, there may not be a solution to these problems in the short term. In outlining the business outlook for CSM Tools, the Chief Financial Officer notes: “Our business depends heavily on our ability to attract and retain qualified personnel, and we are faltering in this area.” (2019 Financial Report, p, 12). This is a concern for the long-term sustainability of CSM Tools.

Deutsch (1949) postulates that the achievement of goal interdependence depends on the business climate that management creates for the employees, and the structural frameworks, such as flexibility and the exchange of knowledge. As Lu and Tjosvold (2013) argue, goal interdependence is closely to task interdependence conducted daily by different teams that have to understand how their actions affect the outcomes of others. FIN 3 expressed that “we do not share information much, and that is the reason we are so dependent on whatever a department does because sharing knowledge is scarce around here.” In agreement with Deutsch (1949), the culture is important because fear of losing one’s livelihood was one of the reasons participants declined to provide written transcripts for this study.

Having gone through and reflected on cycles 1 and 2, the closed-ended questionnaire, the interview sessions, and the analysis of secondary financial information to acquire data to demonstrate the interdependence between working capital and supply chain management, and the perspectives of individuals regarding the goals of these functions, I advised the participants that I would be interested in seeing how they utilized the newfound knowledge gained from their participation in executing their daily tasks. So, we agreed on observation sessions, which will be action research cycle three.

4.4 Mixed Methods Action Research Cycle 3

As Saunders, Lewis, and Thornhill (2019) explain, action research never ends as there are new developments that emerge from the apparent conclusion of one step. And according to Kemmis, McTaggart, and Nixon (2014), action research is simply periods of reflection by researchers and participants on the rationality of their situations and actions, and their understanding of how those actions are conducted, and can be improved. A crucial step in action research is monitoring (Kemmis, McTaggart, and Nixon, 2014) to ascertain that learning is occurring, and that the intervention is serving some purpose.

The observation sessions began in November 2019, and lasted for 2 weeks. As was done in previous informal observation sessions, I observed and initiated conversations to encourage reflexivity on the part of the participants, but cognizant that I could not be overly intrusive so as to interrupt or delay their activities (Kemmis, McTaggart, and Nixon, 2014). As Coughlan and Coghlan (2002) note, the observation method is considered time-consuming, and especially in a business environment where time and profit are foremost, the insider-researcher, who I was, has a dual role of performing his or her tasks, which being involved in an epistemological pursuit. I adhered to ethical principles as the observation method required special consideration for the privacy of the observed who are usually concerned about negative feedbacks that may negatively impact their mobility in the organization (Shani and Pasmore, 2016).The sessions were unstructured, that is, conducted in a free and open manner without any parameters except that I tried to be unobtrusive as much as possible. Notes were taken regarding the participants' methods of operations, interactions, communication, and efficiency.

Even though some of the activities performed were sequentially interdependent (Thompson, 1967), for instance where the operations department had to provide inventory forecast analysis to the finance department, the essence of interdependence was appreciated by FIN 2 who said: "It was good to see that the operations department had their report ready, and I did not need to wait as long as I did last month."

One of the first actions to be addressed for observations to be successful is a change in attitude of the observed (West, 2012). But, in the case of the participants at CSM Tools, it was an instructive exercise that showed how individuals changed their behaviors depending on the situations, and provided some insights into one of the possible reasons the integration of working capital and supply chain management has proven so difficult to achieve. For instance, participant OPER 1 received a higher-than-normal forecast of 85-watt fluorescent commercial and industrial mogul lamps but decided to not question the correctness of the forecast, and he was not sure what caused the unexpected change in forecast. These are issues that could prevent the company from achieving its targeted fill rate as the inventory information may be incorrect (Tan et al., 2017).

I was particularly interested to find out how much interaction and consultation occurred among the participants as they worked. Conferences took place merely by e-mail messages and telephone calls, even when the parties involved were at the same location. Several times the responses were not immediate, and that affected certain tasks that were delayed, even until the following day. I enquired why they did not go directly to the persons, and I was told: "That is how we do it." I decided to take another route, so I requested that participant OPER 1 and I should walk over to the Credit Analyst with whom he needed to work on an account. After about five minutes of discussion they were able to conclude the application process, and present the paperwork to the Credit Manager for approval. The participant remarked that "this process usually takes two days to complete," to which I responded that in-person communication is usually more efficient (Kapoor and Lee, 2013).

As we worked in that shared environment at CSM Tools, we collectively reflected on individual actions and activities, and enquired how certain actions could involve inputs from both departments, so that people could work more efficiently. It meant that individuals would need to keep the goals of their actions and activities in mind (Shani and Pasmore, 2016). Especially at a point when the company needed working capital to survive in an extremely competitive and economically challenging environment, the participants were encouraged to speed up financial analytical activities which could help to increase fill rates within the supply chain. The supply chain, according to Christopher (2016), begins at the point of contact with the sales department, with financing of the chain a major support. However, the salesforce would negotiate payment terms, but did not communicate those to the finance department in a timely fashion.

Actions needed based on the observations: there needs to be greater communication and coordination among the parties to the various transactions that are performed daily at CSM Tools. Individuals need to be more attentive to issues that may become serious problems for the company (Christopher, 2016).

4.4.1 Post-Observation Feedback and Reflection

Kemmis, McTaggart, and Nixon (2014) recommend continuous dialog during observations, and collegial rather than individual discussion and reflection following the observations to allow individuals to review their practice. About three weeks following the observation sessions, the participants were requested to reflect on the process, and the benefits, if any, gained. The post-observation session was on important feature of the intervention process to provide feedback to the participants regarding their activities as I saw them ((Shani and Pasmore, 2016). At the same time, the session afforded the participants a channel to highlight the challenges that they encountered in trying to change their usual work habits to work cooperatively.

OPER 2: “It has always been said that we need to collaborate with one another, but sometimes it is not convenient. We simply focus on our own duties. In response to what he learned from participating in the intervention, OPER 3 said: “So many of us are motivated to do well at our jobs and we tend to forget that if we work together we might do more.” OPER 1 said that during the observation, based on dialog we had, that “The management of risk in the supply chain is the responsibility of the operations department, and that is not a fair thing because we should all be responsible to manage risks.” FIN 2 observed that “there is not much interaction at work, and some people leave their desks only for lunch and to go home at the end of the day.”

As evidenced in the above comments, there are challenges that face CSM Tools in trying to understand and pursue goal interdependence. Some participants found it inconvenient to work with others, suggesting that there are obstacles to collaboration. At the same time, it seems like certain subjects and responsibilities, for example, risk management, are limited to certain departments even though it may be better for risks to be an interdepartmental concern. Lu and Tjosvold (2013) argue, and Deutsch (1949) infers, that management in organization will say that risk management is everyone’s concern, but such a belief would need to be ingrained in the workforce to the extent that individuals would be self-motivated to challenge and circumvent the limitations to do what is best for the organization. The ability to balance disparate responsibilities and time are antecedents of successful teamwork and goal achievement (Lu and Tjosvold, 2013).

Asked whether the observation session forced him to change old habits, FIN 2 said: “I did not do anything differently from what I did on a daily basis, but because you were there, it made me think about how these activities could relate to some activity in operations management.” One example given was “If I called a customer about a payment, how will that impact the operations people.” This was important because the intent there was to work towards a common goal of satisfying the customer. There was a willingness on the part of the employee to efficiently service the customer, one of the overall goals of CSM Tools.

As Ivankova (2015) suggests, the observation and post-observation sessions can be an effective way to get additional data or to support data that has already been collected. For instance, in this study, the information gathered in the post-observation reflection helped to reinforce the themes generated from the semi-structured interviews, and discussed above.

Participant FIN 2 offered findings from a consultation she had with an employee from the operations department. She usually spoke to the associate via telephone and e-mail, but in this instance, they met face-t-face. She described the experience in this way:

> *"I really saw what you were trying to do. You wanted us to speak up if we have problems. I usually wait for someone in operations management or another department to help me with anything I don't understand. Now I can work out certain things for myself, and use their system to find out what I need to know. Besides, I do not feel intimidated to ask questions because people are friendlier."*

By meeting face-to-face, certain concepts were explained visually, and that generated greater knowledge and understanding, and the participant now has the ability to do an activity without having to wait for help. That display of cooperation, described as multifinality (Kruglanski, et al., (2013) exemplified the collaboration necessary to advance the goals of the organization. The search for a common goal of completing a task on time and with a certain level of efficiency, brought individuals together, thereby achieving, if only an episodic example, one of the tenets of action research, that is, of solving a problem together (Ivankova, 2015).

Participant OPER 3, who was uncertain about the entire process in the beginning, was positive in his view at this point. He noted:

> *"At first, I was not interested in learning what took place in the other departments, but after understanding what they do, I must say that their work is interesting, and they were trying to do what the company wanted, to cut costs by negotiating with partners. They were always on the phone."*

That meant that they recognized how interconnected processes really were, and the intrinsic motivation that individuals feel following their understanding and actions in the achievement of a common goal (Deutsch, 1949). Collaboration not only enhances efficiency, but contributes to the personal satisfaction gained by performing a task successfully (Pradabwong et al., 2017).

OPER 1 stated: "I learned that all our jobs are supposed to be helping the organization achieve financial success, which will keep us employed." Intricately linked to this point was the view of OPER 2 who noted: *"I had an understanding of working capital and all that, but I did not know that it had much to do with me. If the money is not in the company to pay its bills as they come due, I might lose my job."*

The success of the intervention was noted in the abilities of the participants to reframe their attitudes and relationships, and to realize that they could learn from interaction. FIN 3 remarked that:

> *"In terms of what I saw, I noticed that the duties are aimed at helping the customers, and whatever we do impacts them. If I am tardy, the customers will be affected, and the other employees will be affected. Our concentration on EBITDA (**earnings before interest, taxes, depreciation, and amortization)(my translation)** as a measure of financial success has to take in the other inputs."*

Participant FIN 1 had been with the company for over 25 years, and Participant FIN 3 had been with the company almost 18 years, so it was understandable, on the one hand, that they were hesitant in the beginning to change their habits. They had been committed to particular routines that might have gone unchallenged, and served them well over the years (Allen and Shanock, 2013).

FIN 1 wrote:

> *"I understood that I needed to complete the credit initiation of customers quickly because the salespeople wanted the information to negotiate with the prospective clients, and my manager told me that the goal of the department was to have a 24-hour turnaround time."*

This comment is clearly in keeping with responses to Question 18 in the closed-ended questionnaire: "Departmental goals are clearly defined," where one participant disagreed, but ten agreed. Individuals understand the need for intra-departmental support to enhance their efficiency which eventually redounds to the betterment of the organization (Deutsch, 1949). Porter (1998) and Deutsch (1949) explain that team building is generated through people's understanding of how they can forge connections within their organizational ecosystems.

Continuing in the positive vein, the participants believed that management should try "to invest in a system in which employees would be willing and encouraged to help others even if they were from different departments" according to Participant FIN 2. In fact, he went on to state that "management should be involved in ensuring collaboration among departments. The literature is replete with references that management should enforce a collaborative environment within their organizations (Scholten and Schilder, 2015). OPER 1 noted that "collaboration should extend beyond finance and operations management."

At the end of the sessions, all participants said that relations definitely improved in that they felt more assured that they could approach others to get things done faster. This development was in direct contrast to the uncertainty they had felt prior and sometime during the intervention, which was the reason for uncertainty being one of the themes that emerged from the interviews. OPER 2, noted, and was supported by OPER 3 and FIN 1 that he had “achieved an expected level of satisfaction.” The participants were asked to make suggestions for improvements, and those will be discussed in the section on implications for management and inter-departmental change.

The opportunity to devote time to reflect and debrief has provided valuable feedback on the intervention, to find out much the participants have learned, not only factual knowledge, but to deal with one another emotionally. According to Zuber-Skerritt and Fletcher (2007), one objective of action research is to encourage practical and incremental learning, and the building of emotional support, and these are evident in the responses and actions of the participants in this study.

4.5 Summary

This chapter provided the results and analysis of the plans, actions, and strategies used to investigate the relationship between working capital and supply chain management, the challenges found in examining that relationship, and how an understanding of goal interdependence could encourage individuals responsible for supply chain and working capital management to collaborate as they performed their daily tasks. The literature served as foundational structure on which the theoretical framework and the ideas for the analysis was built.

There were two phases:

1. A quantitative phase involving closed-ended questions where participants responded on a Likert-type format their levels of agreement or disagreement to questions relating to the

relationships between the two functions and collaboration among individuals from both finance and operations management. Cronbach's Alpha confirmed the reliability and validity of the instrument used. The results showed that much thought and reflection on functional goals do not go into the daily processing of transactions. Individuals merely execute habituated duties within their functional silos.

2. A qualitative phase involving open-ended questions on the same variables in the quantitative phase. The responses to the questions in this face gave greater insights and amplification to the responses in the quantitative phase. Analysis was done using thematic analysis, and four themes were agreed upon: uncertainty, organizational challenges, misaligned goals, and constrained willingness, with organizational challenges as the dominant theme. Observations and post-observation sessions were also conducted.

Additionally, secondary data were collected and analyzed using correlation analysis and descriptive statistics, confirming the findings in extant literature that both functions should be treated as complementary for the overall supply chain to be successful.

The joint results generated by the explanatory sequential mixed methods clarified several of the findings in the literature that human attitudes and perceptions play a significant role in how organizations pursue and to achieve common goals and cross-functional relationships, and that culture and other organizational variables contribute.

Chapter 5 Discussion, Implications, Limitations, and Future Research

5.1 Introduction

The manner in which goals are structured and perceived determine how individuals interact, and those interaction patterns determine the outcomes of how goals are pursued and achieved, whether cooperatively or independently (Deutsch, 1949). The purpose of this explanatory sequential mixed methods research study was to investigate the relationship between working capital and supply chain management practices through the lens of goal interdependence, and executed within the action research framework. This chapter discusses answers and findings relating to the three research questions:

1. In what ways are supply chain practices and working capital theory interdependent?
2. What challenges are encountered in exploring the relationship between working capital and supply chain management?
3. Can an understanding of goal interdependence encourage collaboration?

Coghlan and Brannick (2019) state that action research is a methodology that includes action, research, and participants, and for considering the topic that this study sought to undertake and understand, individuals within CSM Tools had to be contributing parties because the culture that has been referenced throughout the study played a major role in the actions of the employees and their willingness or their apprehension to collaborate and to understand what is required for goals to be interdependently achieved (Deutsch, 1949). The culture also affected the degree to which integration of functions could be achieved through socialization.

According to Bolino, Turnley, and Bloodgood (2002), organizational effectiveness is a product of the organization's culture that can facilitate the development of citizenship behavior that can lead to enjoyment of work. Based on reactions from the semi-structured interviews and closed-ended questionnaire done for this study, barring the financial benefits, individuals did not particularly enjoy work. OPER 2 said that "money makes an employee happy, nothing else really matters." Fin 2 added "job security is key for me." Zhao and Huchzermeier (2019) examine the attitudes of individuals in various organizations, and find that the absence of relational goals tends to stymie progress and efficiency. Relational goals are defined as the establishment of relationships that transcend personal rewards (Zhao and Huchzermeier, 2019).

Thus, against this background, and in light of the literature review and the data gathered (both primary and secondary), we will now answer and discuss the research questions.

5.2 Research Questions Answered

Question 1: In what ways are supply chain practices and working capital theory interdependent?

The study of functional interdependence can be characterized in terms of an interplay between what Tsai and Hsu (2014), Oliva and Watson (2011), and Deutsch (1949) refer to as individual perception of their value to the collectivistic objectives of the organization and the individual's perception of his or her own objectives and goals within the parameters of that organization. Inherent in this perspective is the view that for working capital and supply chain to operate interdependently, employees need to understand the purpose of both functions (Zhao and Huchzermeier, 2019). That employees should understand the purpose of supply chain and working capital could be seen in the responses to both the open-ended questionnaire and the semi-structured interviews where most of the participants said they knew the purposes of both functions. However, those positive responses alone could not suffice to answer the question of interdependence between working capital and supply chain management. As such, secondary data were collected that showed that interdependence.

Pearson correlation coefficients discussed in section 4.4, show a positive relationship between working capital and the CCC. This means that as firms speed up the CCC, working capital increases, and vice versa. On the other hand, slowing down the CCC will slow the rate of working capital intake. That is why researchers argue that the firms can increase the inflow of working capital by shortening the receivables schedule and extending the payables schedule. This policy should help to smooth out any kinks in the supply chain (Wetzel and Hofmann, 2019; Hofmann and Kotzab, 2010; Richards and Laughlin, 1980). On the other hand, the customer might be experiencing financial problems, and need to hold more working capital, so he could extend his payment schedule to you, thereby causing a crimp in the supply chain. According to Hofmann and Kotzab (2010), these the moves of one company could be done at the expense of another, and one way of preventing that problem could be to ensure communication between supply chain partners, particularly between finance and operations. That communication and relationship between departments are crucial to the firm's profitability and sustainability (Hofmann and Kotzab, 2010; Richards and Laughlin, 1980).

There is a sharp debate in the literature claiming that the goal of working capital management is to help the firm maintain liquidity, but other researchers (Deloof, 2003; Richards and Laughlin, 1980) contend that the goal of working capital is more expansive, and includes enabling the firm to maximize profits, which some (Baños-Caballero, García-Teruel, and Martínez-Solano, 2014) believe to be the principal goal of the firm. On the other hand, some researchers (Wetzel and Hofmann, 2019; Christopher, 2016; Christopher and Ryals, 1999) argue that one of the least mentioned and researched goals of supply chain management is to enable the firm to remain a profitable going concern. In this context, and as Zhao and Huchzermeier (2019) postulate based on their industry research, working capital and supply chain management are the twin variables that businesses cannot afford to treat as opposites. In fact, they operate in parallel form as the business tries to maximize shareholder value. Thus, as Richards and Laughlin (1980), the originators of the cash conversion cycle (CCC) point out, the liquidity-profitability debate should be relaxed as both liquidity and profitability are necessary for business survival, and both should be the argued as goals of working capital and supply chain management.

As FIN 2 points out "a delay in orders has implications for cash flow management," and cash flow management has implications for the supply chain (Hofmann and Kotzab, 2010). The authors also explain that that supply chain practices are best executed in collaboration with working capital to ensure adequate funds are available to drive operations. This view was instantiated at CSM Tools between 2009 and 2014, the aftermath of the financial crisis that witnessed insufficient working capital to fund daily operations, and the company had to rely of external funding, which prompted the Chief Financial Officer to comment that "our remaining resources were depleted, and there was a slowdown in the receipt of inventory and the delivery of products to customers" (2018 Financial Report).

In fact, days inventory outstanding (DIO) averaged 113 days, compared to 107 days between 2015 and 2018 when economic conditions improved. Between 2009 and 2014, however, days sales outstanding (DSO) averaged 47 days, compared to 2015-2018 when it was 55 days. This was due to the fact that CSM Tools adopted a more conservative credit policy by funding short-term operations with long-term debt, and at the same time changing the payment policies for customers to accelerate receipt of payments during the crisis. This was done in response to the extended DIO. Aktas, Croci, and Petmezas (2015) explain that companies should realize that holding a substantial amount of working capital is not desirable during an economic prosperity, whilst the converse is true and necessary to fund the supply chain.

Companies such as Dell Computers and Amazon have netted negative CCCs because they have realized that immediate receipt of funds enables the smooth operation of their supply chains (Ruback and Sesia, 2000), and Dell has noted that working capital is their source of company value. The issue of Dell came up during the post-observation discussions, and FIN 1 exclaimed: “That’s cool,” with “cool” here meaning “good point.”

Liebl, Hartmann, and Feisel (2016) explain that accounts receivable (AR) and accounts payable (AP) are cash management variables that have implications for supply chain management, especially within the modern supply chain financial management scheme and reverse factoring where a financial institution facilitates the movement of funds between the two accounts. FIN 1 noted that “we did not speak about AP and AR because we did not need to.” Both FIN 1 and FIN 3 worked in finance, and were responsible for AP and AR, respectively. Yet there was no obvious discussion about the accounts, and for that matter, no reference of them having implications for the supply chain. This evidenced the lack of communication that has been noticeable in the responses to both the closed-ended and the open-ended questions posed for this study.

Templar, Hofmann, and Findlay (2016) point out that in most organizations credit policies and risk analysis are performed by finance specialists, but they find that the impacts of these functions are important for the supply chain, and that especially risk management should be included in the responsibilities of operations management. Risk is compartmentalized into financial risk and supply chain risk at CSM Tools. It was pointed out earlier that OPER 1 said that supply chain risk was the responsibility of the operations department, and that it was unfair to leave that duty to one department. Gill and Biger (2013) argue that the issue of risk should be an umbrella function under which all departments are structured, because the separation of risks devastated companies during the financial crisis when finance and operations did not did not communicate.

As Zhao and Huchzermeier (2019), Hofmann and Kotzab (2010), and Richards and Laughlin (1980) argue, working capital and supply chain management are complements within the overall structure and performance of a company's bottom-line, and that complementarity should be optimized with coordination and knowledge-sharing across both operations and financial management departments.

Question 2: What challenges are encountered in exploring the relationship between working capital and supply chain management?

The structure of organizational functions was not designed to be complex, but to facilitate coordination and collaboration resulting in efficiency and high performance (Deutsch, 1949). In the same manner, the finance, and operations departments, with their attendant functions of working capital and supply chain management, respectively, are expected to perform collaboratively to benefit organizational performance (Christopher, 2016; Hofmann and Kotzab, 2010). However, there are obstacles that confound the processes of interdepartmental collaboration. Deutsch, Coleman, and Marcus (2014) and Lu and Tjosvold (2013) identify two major challenges to effective collaboration: ineffective information sharing, and ineffective interpersonal interactions. The authors point out that individuals are somewhat apprehensive to step out of their comfort zones to associate within the organization, and that results in situations where knowledge remains implicit rather than explicit. Implicit knowledge is knowledge acquired largely independently, based on individual's actions and experiences, whereas explicit knowledge is codified and formalized, and can be transferred and understood by many (Nonaka, 1994). Both types of knowledge are required in the organization, but explicit knowledge is more pertinent for collaboration (Nonaka, 1994).

Melnyk, Stewart, and Swink (2004) point out that a lack of understanding regarding the role of supply chain management has long been a challenge to supply chain integration. At the same time, Wetzel and Hofmann (2019) find that the misunderstanding of workflows and goals presents a challenge to interdepartmental collaboration between working capital and supply chain management. of supply chain management. This was expressed by OPER 3: “as employees come and go, they have their specific ways of doing things, many of us do not understand the workflow.” This is caused by a lack of interdepartmental training as businesses are under pressure to deliver profits to the sacrifice of other features that could help all employees to be more involved in the sharing of knowledge that could help them to perform better (Lu and Tjosvold, 2013). FIN 3 noted: “we do our jobs well and they do their jobs well. That’s all that is important.” In response to the statement “We share information constantly” on the closed-ended questionnaire, eight respondents agreed, and three disagreed. Although this could contradict the statement from FIN 3, we need to take into consideration that three executives responded to the questionnaire, and management bias could have occurred (Hu, Pavlou, and Zhang, 2017).

Coghlan and Brannick (2019) believe that the organizational setting presents a challenge to research. For instance, action research demands time and other resources which many organizations find cumbersome, especially in high-earnings periods. In fact, at the start of this study, and on informing management of the intent, I was advised “we do not have the resources to allocate to investigation,” and this was evident in the challenge of procuring participants for the study. As discussed earlier, eleven individuals initially participated, but only 6 endured to the end. So there are organizational challenges, which is one of the themes that emerged during the interviews with participants.

Christopher (2016), Coughlan and Coghlan (2002), and Christopher and Ryals (1999) argue that supply chain managers encounter challenges integrating supply chain practices into with the overall business strategies of the organization because overall business strategy seems to be predicated on financial strategy and financial performance. This view is buttressed by the findings of Kaplan and Norton (1992), who posit that many organizations give scant consideration to what is described as the support functions. However, in academia especially, operations management is considered to be one of the three main functions in the organization, with finance and marketing being the other two (Christopher, 2016; Pedroso, Da Silva, and Tate, 2016). This was brought out in the interviews, as FIN 2 explained that "as long as I have been with the company, I did not have to understand the operations side of the business because finance was the important concern for management."

One of the primary challenges facing researchers, and even organizations in trying to understand and examine the relationship between working capital and supply chain management is the lack of performance measures and metrics that align supply chain performance with finance (Wetzel and Hofmann, 2019). The CCC seems to be the closest approximation to linking supply chain practices to working capital (Wetzel and Hofmann, 2019; Hofmann and Kotzab, 2010, Richards and Laughlin, 1980). However, Wisner, Tan, and Leong (2014) propose finding supply chain activities that match DIO, DSO, and DPO. For example, inventory costs and delivery time could be associated with DIO, customer order fill rate, correct invoicing, and unable to ship due to non-payment could be associated with DSO, and discounts not taken, and past due payments could be associated with DPO. At the same time, their suggestion is similar to that of Liebl, Hartmann, and Feisel (2016) that intra-departmental communication should be emphasized. For example, individuals in charge of DSO and DPO should understand the relationships and how they affect the supply chain, which should be geared towards maximizing efficiency and minimizing time lags in customer order fulfillment (Wisner, Tan, and Leong, 2014). As noted earlier, FIN 1 and FIN 3 who were responsible for DSO and DPO, have never discussed the relationship between these activities.

Workloads and time constraints frequently came up in the interviews. So individuals seem to use these issues as means to not engage in collaboration. On the contrary, Deutsch (1949) and Lu and Tjosvold (2013) find that by collaborating, individuals are more likely to ease the pressures posed by organizational constraints as they may be able to find and eliminate duplicative activities, and as they associate more as a team, work may become less discomforting. FIN 2's experience as she collaborated with another employee underscores this perspective. She expressed at discovering and understanding concepts that would otherwise be amorphous, and would possibly waste time to get the information through other sources.

The demarcation between functions, with no pressure to collaborate, and no understanding of goal interdependence presents a challenge not only to the employees in those functions, but to the organization as a whole, because the objective of efficiency is thwarted (Lu and Tjosvold, 2013, Deutsch, 1949). The modern organization that has to contend with intense competition and changing customer demands places great emphasis on supply chain efficiency, but that efficiency which is not achievable because of inadequate understanding that the supply chain needs working capital to operate (Wetzel and Hofmann, 2019; Richards and Laughlin, 1980). The authors conclude that there is a gap between management's goal of financial performance and inter-functional coordination, which often is not addressed until there is an impending problem.

Organizational opportunism also created competition among employees as they tried to outperform one another to gain promotions. Five of the respondents agreed to the question: "Departments blame one another when things go wrong," and OPER 2 suggested that people competed to "look good" in the eyes of management. This competitive nature is inspired by mistrust among employees especially when they do not understand the goals to which they aspire, or that they are working towards the same goals (Deutsch, 1949). Tsai and Hsu (2014) suggest that trust is an antecedent of supply chain and organizational integration, and one way of building trust is to ensure that everyone has access to the same information which could be facilitated with technology.

Because individuals failed to share knowledge at CSM Tools, and the fact that the finance and operations departments were privy to two different sets of information and forecasting tools, there was information asymmetry that might not have contributed to deliberate mistrust but certainly to inefficiency. OPER 2 pointed out that: "the information we have does not match with finance. They use different tools, and if we need something we contact one of them."

Ethical challenges cannot be discounted. Because individuals in the organization seemed not to reject conventional procedures at CSM Tools, I had to be very careful to note their reactions as I tried to expose them to different sets of information. FIN 2 said: "we do not want people to think we are spying on them, so we make sure to ask them to provide the information we need." Shani and Pasmore (2016) explain that the rigidity of the organization culture will tend to stymie the action research process, and it does inhibit the flow of information between finance and operations management, thus affecting working capital and supply chain transactions. Wetzel and Hofmann (2019) observe that the lack of information moving between supply chain and working capital management, whether the goals are intertwined, or simply information about the structure of the activities, has made it difficult to mirror processes from both functions.

It was equally challenging to combine the role of scholar and practitioner because I had to be careful that that role duality did not cause role ambiguity (Coughlan and Brannick, 2019). I had to balance the demands of management to not interrupt the daily operations, the demands of action research to involve employees, the level of complacency employees had with their current job performance, and my own personal justification for undertaking the study.

The average age of the participants was 46 years, and the average longevity in their positions was 15 years, so their attitudes and perspectives were steeped in the culture of the company, making it challenging to change their complacency. Levinthal and Rerup (2006) point out that one of the overarching and most challenging adventures in organizational change and improvement is to manage the level of complacency that sometimes form a protection around an inadequate system that employees accept. As FIN 1 claims: “Nobody bothers me.” Such an attitude made it a challenge to institute change.

To complicate matters in terms of knowledge exchange and attitude change was the apparent absence of double-loop learning (Argyris, 1977). Double-loop learning involves the questioning of policies, actions, processes. We have noticed that the participants have not overtly shown that they wanted to change by questioning how they have been accustomed to doing things. This is indicative of the complacency of which Levinthal and Rerup (2006) speak, and to which Argyris (1977) refers as hidden errors that can derail organizational objectives.

Zhao and Huchzermeier (2019), and Hofmann and Kotzab (2010) believe that by establishing performance benchmarks, emphasizing that inter-departmental tasks should be jointly owned, and explaining how the combination of working capital and supply chain management can create a competitive advantage for the firm, management and other employees will come to realize the benefits of a collaborative effort, and the challenges might then be minimized.

Question 3: Can an understanding of goal interdependence encourage collaboration?

Deutsch, Coleman, and Marcus (2014) contend that goal interdependence is an organizational orientation in which individuals use the efforts of their colleagues to inform their decisions to become part of the team aimed at advancing the organization’s goals, but at the same time, aligned with the goals of those individuals. Essentially, goal interdependence is a recognition that activities done independently will result in inefficiency (Deutsch, 1978). Extant research finds the constant and organizationally-determined and monitored exchange of information is a core requirement for goal interdependence.

The participants in this study responded that they exchanged information, but the extent of the exchange could be problematic, in that information was not monitored by managers, and the exchange was more formally done during month-end closing activities. This could be a contributing factor to the challenges experienced in trying to merge the goals of working capital and supply chain management discussed above. In fact, OPER 2 explained that "there is not that need for formal exchange of information because each department knows what to do to move performance."

Lu and Tjosvold (2013), and Deutsch (1973) argue that as individuals seek and understand the interdependence of goals, their attitudes towards work change. FIN 2 explained that "as I got to know that we are working towards the same objective, I feel much better about what I do." Lu and Tjosvold (2013) find that even the perception that a team or a department places much emphasis on the attainment of mutual goal plays a significant role in determining the level of satisfaction that the individual and the team gets. They become motivated to engage in the appropriate actions necessary to help the organization achieve its overall objective of shareholder value maximization (Lu and Tjosvold, 2013). Additionally, when individuals perceive that their goal achievement rests on the achievement of someone else's goals, they become motivated to see that both sets of goals are achieved. Porter (1998) postulates that a greater level of interaction and coordination occurs when goals are perceived as interrelated.

This could be seen played out the interaction between the participants and other employees during the observation sessions for this study. OPER3 said "It was a new feeling to know that we were on the same page." In fact, OPER 1 stated "I spoke directly with employee X for the first time, even though we had talked via e-mail." Participant OPER 2 stated: "Mario was very cooperative for a change. I understood what he was saying, and I could explain to him exactly what

I wanted." She further stated: "I used to ask him questions. Now I was able to say what I thought the issue was."

The understanding that goal interdependence is predicated on team interaction unleashes an element of motivation that many of the participants had not experienced before. Deutsch, Coleman, and Marcus (2014) point out that they could detect a change in management outlook as they discussed the concept of goal interdependence with certain groups, because managers were looking for ways to get their employees to collaborate more efficiently.

Barney (2001) posits that one of the most critical and difficult tasks in any organization is to harness the various resources into a cooperative whole, and designing cross-functional teams is one way to start. For instance, Christopher (2016) posits that team goals of supply chain management should be to maintain a high customer order fill rate, to anticipate inventory shortages so that customers can be notified, to retain customers in order to build customer equity, and to create value for the firm and its customers. These goals, he argues, are not function-specific, but should be the goals of all parties in the organization.

Deutsch (1949) posits that task and goal interdependence could be considered as prerequisites of a service climate because goal interdependence stimulates a yearning to achieve one's objectives. As OPER 3 noted, "we all want to enjoy what we do because time goes faster then." Notable in the interviews was the view that as departmental goals became clearer, individuals feel more certain of what they were expected to do, and according to FIN 1, "how we could cooperate with others." At the same time, the correlations between the CCC variables in table 7, section 4.4, reveal that the goals of working capital and supply chain principles are related, and those relationships were pointed out to the participants.

Prior to the understanding of the need and rewards of working towards mutual goals, participants were content with fulfilling the duties outlined in their job descriptions, with little interaction, and as management stated, individuals were expected to perform their duties with minimal supervision. Some took that to mean, as FIN 1 explained "they do their work and we do ours." Schulze-Ehlers et al. (2014) find that confidence emanates from knowledge. The interaction between Participant OPER 2 and Mario exemplified that belief. This is a transcendental discovery of the value knowledge sharing and collaboration emerging from an understanding of the principles of goal interdependence (Lu and Tjosvold, 2013; Deutsch, 1949).

Deutsch (1949) reveals that an understanding of goals creates self-determination that helps the organization to transform those goals into an organizational behavioral asset. The examples cited earlier of participants working cross-functionally with individuals who did not participate in this study are a telltale of the importance of knowing how to achieve goals in a cooperative manner (Lu and Tjosvold, 2013). Adner (2016) recommends that management should not only set goals. They should show how the goals are connected, provide incentives for individuals to achieve those goals, and should also have systems in place to monitor the achievement of those goals. Shared goals can help individuals and organizations feel supported, and will bring them to a point where they can open-mindedly discuss their experiences (Deutsch, 1949). This is the experience that was evidenced in this study, as we moved from participation doubt in the beginning to where individuals could feel comfortable to divulge certain information that helped to facilitate the explanation and learning of the value of goal interdependence.

It is perhaps the emphasis on the quantitative relationships, even though those are relevant, rather than on the cognitive interdependence (Porter, 1998)), or the re-imagining of organizational relationships, which is missing from the discussion of the relationship between working capital and supply chain management. This study tries to fill that gap. We are reminded by Robson (2011) that empiricism in action research is aimed at helping people to achieve objectives rather than to merely follow positivist doctrines.

5.3 Action Research, Reflections, and Implications

Coghlan and Brannick (2019) point out that action research is fundamentally a merger among three variables: action, research, and participants in the creation of actionable knowledge. Actionable knowledge is knowledge that transcends mere theory to encompass theory, practice, and action (Argyris, 1998). Actionable knowledge leads the individual to the decision about which organizational actions to take, and how to implement them to create sustainable organizational change (Argyris, 1998). In this context, it is important to discuss and illustrate how new knowledge was created and used in this study. Reflection is an essential ingredient in the creation of knowledge, especially as it relates to the scholar/practitioner, and explicitly becomes a part of the learning of the participants (Antonacopoulou and Chiva, 2007).

This chapter, therefore, provides a summation of my professional journey as I conducted the research, including the reflection, learning, and development experienced with the utilization of action research to help to improve the work experiences of the participants, and by extension, the experiences of individuals working in supply chain and working capital management.

5.3.1 Reflections of an Evolved Scholar-Practitioner

Scholar-practitioners often engage in professional settings where their duties and obligations are intertwined with those of the people they eventually request to become partners in the quest for action and change regarding some problem that is discerned in their organization (Coughlan and Brannick, 2019; Coughlan and Coghlan, 2002). Action research allows practitioners to become researchers who set goals, generate novel ideas, and help others to reflect on their own practice and actions in order to effect change (Coughlan and Brannick, 2019).

The journey towards the end of this study was one characterized by vagaries. This research started six years ago, and over that period, several doubts came to the fore. The problems of working in a new culture not accustomed to being interrupted with research, of trying to convince management of the inefficiency with which members of the organization were working, of formulating a research problem around that level of inefficiency, of finding individuals willing to relinquish their personal beliefs about the organization in order to participate in changing the way work was dome, and of helping them to see the value to them and to the organization working collaboratively, were far from being an easy undertaking.

Part of navigating the complex nature of the new culture, and determining how to go about starting the action research, was the element of being able to trust people within the organization, and their honesty in providing answers to the questions I had (Coughlan and Brannick, 2019). As Lewin (1946) recommends, I was planning to unfreeze-change-refreeze a system in which I was not in control of crafting organizational strategies, not even for the finance and operations departments that I decided would be the subject of the study. Coughlan and Coghlan (2002) suggest that even teachers are in a position to influence the way their classrooms are structured, but many action researchers in for-profit settings are dependent on others to provide the working frameworks. The latter was the situation in which I found myself needing to unfreeze, or upset the cultural status quo. This also meant managing the politics of the organizational status quo where individuals wanted to work independently rather than collaboratively. OPER 3 preferred to work "at my own pace." Goal interdependence and collaboration do not allow for individuated structuring of activities, because teamwork should take precedence over singular performance (Lu and Tjosvold, 2013).

As the research started, and as the ideas seemed to become clearer through frequent dialogs with employees, the initial dread that I had started to subside, and I realized that I could make a difference. There were constant talks that the supply chain needed a boost of efficiency, and that business was slowing down as customers seemed to be experiencing financial problems, resulting in past due payments, and reduced cash inflow to CSM Tools. As such, the opening was there to exploit the intersection of working capital and supply chain management to see how that could generate efficiency (Hofmann and Kotzab, 2010), because it became apparent to me that the two departments were operating at cross purposes.

Reflecting on the context of the study, I understood that action research encourages the collection of data about my situation, to examine my attitude and perspectives, and the attitudes and perspectives of other employees, and to use data gathered to critically address the problem I saw, while convincing others that a problem existed (Coughlan and Brannick, 2019). That is where I realized that by its contextualized nature, the action research paradigm affords the research a certain level of personal and professional development that differs from the type of quantitative research to which I was accustomed. I was able to speak with individuals, as well as have them co-produce the study. This type of interaction and collaboration was rewarding, and it was the same type of interaction and collaboration I believed, and in concurrence with Wetzel and Hofmann (2019), and Hofmann and Kotzab (2010) was required to generate efficiency in linking the goals of working capital and supply chain management.

Even though disillusionment would set in at times, and I was doubtful that action research could be executed in a for-profit outfit, the acknowledgement from the participants that they have learned from the process has helped me to evolve, and has given me a sense of vindication for persisting. I can now attest to the fact that action research is executable in many different settings. Coughlan and Coghlan (2002) question the applicability of action research to operations management, a discipline that is mostly investigated from a positivistic perspective.

A key factor for the action researcher is to stand back and reflect on the process as it is happening to see if the plan for change is coming to fruition, as the success of that plan is a contribution to the body of knowledge (Coughlan and Brannick, 2019). For instance, during the post-interview and observation stages of this study, the participants could identify instances in which the goals of working capital could be linked to the goals of supply chain management. OPER

3 noted that "making notes in the system regarding a customer's payment being late is alerting chain managers that customer orders may be delayed, AR problems." It was encouraging to realize that learning had taken place.

My role as an action researcher was to identify an area for improvement, contribute to the strategies and methods for improving that area, as well as to contribute to development of the knowledge required to improve the area. At the same time, that knowledge co-created with participants who profited from the process, and would be able to systematize the adjustments that were made. I was able to grapple with the complexities of the CSM Tools, by constantly reflecting on the moves that were made during the intervention, and what else could be done. One of the challenges was to work with and bring together multiple and conflicting personalities, a responsibility that helped me to develop as a practitioner in an organizational setting where interdependence between functions and people was being sought.

Academically, I have grown so much in the sense that I was able to build on theory that business functions are expected to work together for the benefit of the organization (Porter, 1998; Richards and Laughlin, 1980), and I am better able now to argue that philosophy. As I tried to legitimate a collaborative philosophy that departments that work together are more productive and engaged (Deutsch, 1949), I develop both professionally and academically to use action research to deliver that message. Successful action research aligns with Porter's (1998) position that helping individuals to work collaboratively, and to view things from a different angle are two of the most meaningful and enduring pleasures in business.

5.4 Implications for Management and Inter-departmental Change

According to Hofmann and Kotzab (2010), working capital is such a pervasive term in business, yet its importance is so misunderstood in the operations of the firm, and especially in contemporary supply chain practices. The financial crisis that has debilitated so many manufacturing and service firms has created an awareness that focusing on mainly long-term financial strategies is not a practical business move, but that short-term strategies, of which working capital is a part, are just as important in terms of implications for business survival (Richards and Laughlin, 1980). This recognition has significantly amplified the need for research that puts the goals of working capital at the center of the supply chain (Wetzel and Hofmann, 2019).

This study has heeded the advice. The goal of this research was to show employees in the finance and operations management departments at CSM Tools how they could use the philosophy of goal interdependence to understand and work toward a collaborative relationship between working capital policy and supply chain practices. The research was conducted through the lens of action research, with six participants from the finance and operations departments. Apart from the relationships discussed between the functions, the research found interesting details regarding the personalities of the participants, the structure and culture of the organization, the competitive nature of the relationship between the departments, and some of the challenges faced in conducting action research in a for-profit organization.

First of all, the research attempted to be rigorous in its generation, gathering, and exploration of an inter-departmental issue, the relationship between supply chain and working capital management, which has been discussed for a long time in the literature (Hofmann and

Kotzab, 2010; Timme and Williams-Timme, 2000). Management has frequently sought to find ways to be more efficient, and to work across functions. According to the CEO of CMS Tools,

"Our industry is fragmented yet competitive, and significant steps must be taken to utilize the limited resources we have to strengthen the bond between us and our customers, and we can achieve this by working together." (2016 Annual Report, p. 2).

Thus, management has issued the mandate, and this is evidence of upper-management support for a plan to achieve inter-departmental collaboration.

Several recommendations that could help to address the problem noted by the CEO emerged from the interviews and discussions conducted in the study:

1. Task managers with ensuring and monitoring how departments work together
2. Top management should be more vigilant in terms of collaboration, and knowledge-sharing,
3. Formal customized cross-training between departments
4. Trust and time are key factors in overcoming challenges to change
5. Eliminate duplications, and increase efficiency by working together
6. Service standard metrics should be established to ensure that performance levels are achieved
7. Accounts payable and accounts receivable should know what each other is doing all the time
8. Customer-awareness seminars should be planned to ensure that everyone understands customer needs
9. Employees should be committed to goal expectations across all departments
10. Customer service should be shared between finance and operations that could help to ease the frustration for both internal and external stakeholders

The participants believe that the findings from this research will help to enhance the efficiency the company's distribution of goods and services that management has been promoting. These recommendations have found support in the literature on goal interdependence (Deutsch, 1949; Lu and Tjosvold, 2013), who argue teams working towards mutual goals provide greater satisfaction for customers, and create sustained motivation for employees. Similar perspectives have been given in relation to the intersection between working capital and supply chain management (Zhao and Huchzermeier, 2019; Wetzel and Hofmann, 2019; Hofmann and Kotzab, 2010; Timme and Williams-Timme, 2000; Richards and Laughlin, 1980), where the authors have postulated that by collaboratively pursuing the mutual goals of the two functions, the organization is operating more efficiently, and closer to the value-maximizing goal of the firm.

In addition to the recommendations made by the participants, table 9 provides a list of recommendations and the implications it may have in terms of process and goal-interdependence improvements.

Lu and Tjosvold (2013) point out that interdependence is generated not only by top management, or lower-level personnel, but a combination of interlevel teams that are dynamic enough to change strategies to match the needs of the business environment. There is evidence in CSM Tools for changes that can achieve that interlevel strategy. It may be all lip-service because I got only tepid support from management that insisted that workflow has provided a challenge for practitioner research. However, their business reports have frequently called for collaboration. And, the findings of the current study, that individuals are willing to form teams to improve performance, are seeking to find motivation at work, and to do whatever is necessary to overcome challenges to help CSM Tools achieve its goals, are a foretaste of what is possible if management decides to make action research a part of the business strategy (Coughlan and Coghlan, 2002).

Table 9 Recommendations and Implications for Process Improvement and Goal-interdependence

Recommendations	Implications
▪ Task managers with ensuring and monitoring how departments work together	Getting upper-level management involved will help to promote cross-functional collaboration, and increase efficiency. Time may be a factor based on what has been discussed, especially under the theme of organizational challenges
▪ Using technology to help improve and streamline processes.	Allowing all departments to have access to the same information, thereby limiting information asymmetry
▪ Service standard metrics should be established to ensure that performance levels are achieved	A clearly-defined set of metrics that shows a link between working capital and supply chain management could help to remind employees of the goals to which they are striving
▪ Customer-awareness seminars should be planned to ensure that everyone understands customer needs	As the participants suggested, when everyone is involved in customer service, it could alleviate the stress that some individuals feel. This could also help to advance the issue of total quality improvement being promoted by management
▪ Representatives from finance and operations should be involved in monthly expenditure decisions on inventory levels	This could allow the supply chain manager to leverage spend to take advantage of cost-reduction opportunities, so as to help to manage inventory and mitigate risks. Singhal and Raturi (1990) point out that inventory holding costs could represent approximately 60% of the value of the inventory held per year
▪ Establish a review system to regularly monitor efficiency and to monitor risk	With employees from different functions and with varying education backgrounds and perceptions, someone could catch discern an issue that others may miss. The ability of employees in finance and operations management to manage risk was one of the complaints lodged by one of the participants
▪ Incentivize individuals for effort at cross-functional collaboration	Rewarding individuals monetarily or with promotion can boost morale, and allow others to see the merits in working towards integration. Deutsch (1949) believe that rewarding those who pursue interdependence will bring others to join. This could also build trust among employees as they move towards the achievement of team goals (Porter, 1998).

This is the process of developing actionable knowledge. The recommendation to develop a set of supply chain metrics that could show a connection to working capital metrics is instructive. In this case, we need to deconstruct the functions to examine the various components so that we will be able to see how the components relate. According to Antonacopoulou (2009), argues that there has to be clear understanding of what is happening for one to be able to generate actionable knowledge. The fact that the participants in this study have produced suggestions shows that they understand that processes can change, and that involvement, willingness to learn and the exchange of knowledge are precedent to the creation of knowledge that can engender change and affect behavior. Actionable knowledge is created with dialog in action. That is, individuals reflect on and discuss the processes as they are being performed, a co-creative undertaking, in which old habits are adjusted or relinquished, and replaced by creative thinking. Antonacopoulou (2009) believes that unlearning has to occur for actionable knowledge to be generated.

From a working capital perspective, our results also have significant implications for corporate policy. Given that working capital averages approximately 57% CSM's current assets Appendix C), corporate strategy should pay more attention to optimizing the use of working capital to help the company to rely less on borrowed funds to finance supply chain activities (Hofmann and Kotzab, 2010). One possibility to facilitate this would be to ensure that accounts payable and accounts receivable work in tandem with each other, and that working capital and supply chain management roles are coordinated (Wetzel and Hofmann, 2019; Timme and Williams-Timme, 2000). What needs to happen is that the firm does allow cash to be unnecessarily tied up in working capital policy, and that there is a continuously smooth flow of cash among suppliers, CSM Tools, and the downstream customers (Wetzel and Hofmann, 2019). This is where reverse factoring as discussed above, can be utilized, and in agreement with Zhao and Huchzermeier (2019), the firm can craft working capital policy to make more profitable investments in supply chain activities.

This study has helped to broaden the scope of the working capital binary-policy management practiced at CSM Tools, and variously discussed in the literature, where the primary recommendation to manage the flow of working capital is to speed up accounts receivable, and extend accounts payable period. This study shows management that working capital management is more than that (Zhao and Huchzermeier, 2019). It includes the management of knowledge, personalities, and teamwork as well. It would be significant for management to institute a cross-training program to ensure that individuals are not only experts in certain areas of the business, but have knowledge of what other departments do.

The fact that CSM Tools the percentage of sales method to forecast the amount of working capital to have makes it even more significant that there is coordination between supply chain practices and working capital policy. The percentage of sales method is commonly used to forecast balance sheet and income statement items. The advantage of using this method is that it is easy to calculate, but the main disadvantage is that it is based on the assumptions of stable economic conditions and an uninterrupted supply chain (Rappaport, 1998). This method presents a challenge and false forecast if linearity between sales and working capital is violated (Wetzel and Hofmann, 2019). The goal of working capital management is to maintain a balance among receivables, payables, and inventory, so in an irregular supply chain, the finance department is under pressure to monitor the working capital demands, and that is one of the main reasons for the emphasis on reducing functional departmentalization between working capital and supply chain management (Wetzel and Hofmann, 2019). Both sets of employees are needed for monitoring purposes to avoid the situation following the financial crisis when the operations department blamed the finance department for not informing the company that some customers were experiencing financial problems, and that accounts receivable was mounting. Even though 8/11 respondents to the closed-ended questionnaire disagreed that departments blame each other for things that go wrong, the sentiment was expressed, and response biases could be involved in the responses.

A 23-minute Zoom meeting was held in November 2020, with the Comptroller, the Marketing Director, and the Credit Manager, along with the six participants, to update them on the findings. The general attitude was one of interest. Also, the recommendations made by the participants were sent to the group. The Comptroller said that the findings would be taken “under advisement.” Although this is not a ringing endorsement of the project and its findings, but rather speaks to the challenge of getting management to accept action research (Coughlan and Coghlan, 2002), there remains hope.

Management has often spoken of collaboration in recognition of the need to be more competitive, efficient, and to be able to service the customers with the utmost understanding and loyalty, and to cut customer response and order-processing times. So this should be a benchmark study to which management could refer to improve inter-departmental relationships, which would help to achieve those goals.

5.5 Limitations, and Suggestions for Further Research

Although this study provides important insights into the relationship between supply chain practices and working capital theory, and the mediating role of goal interdependence, there are certain limitations that need to be pointed out, and further research could be done to help address those limitations.

5.5.1 Limitations

This study was conducted in an organization that had not done any study of this nature that requires employees to fully participate. Reason and Bradbury (2001) refer to this as the conscientization of organizational witnesses, where the researcher tries to awaken the organization from its complacent position to realize that individuals need to understand how the system works, and that by there might be a different way to do the things to which those individuals are accustomed. That the context of this study was a for-profit organization, coupled with heavy workloads stemming from a high rate of attrition, proved challenging (Coughlan and Coghlan, 2002). These factors also made it challenging to conduct action research, considering the human participation that was required.

One of the limitations faced in conducting this research was the fact that most of the extant research focuses on either working capital or supply chain management, with a few researchers (Wetzel and Hofmann, 2019; Zhao and Huchzermeier, 2019; Zhao and Hofmann and Kotzab, 2010; Timme and Williams-Timme, 2000; Richards and Laughlin, 1980) concentrating on the complementarity between the two functions. The subject of goal interdependence was not an area explored by these authors. So, this study sought to create a triangular relationship involving working capital, supply chain management, and goal interdependence, with not much precedence. Nonetheless, this challenge was worthwhile, because it allowed for much flexibility in utilizing mixed methods action research, which in itself, is a wonderful research orientation as explained above.

From an empirical stance, even though the cross-section of participants was suitable, individuals from both departments, and varied years of experience with the company, the level of participation was low, and the researcher had to do purposive and convenience sampling, not that these were necessarily bad choice. However, due to the cultural disposition of the organization, where individuals preferred to work independently, it was difficult to access more human resources. This may make extrapolation of the findings of this study to other contexts difficult, but it has nonetheless laid the groundwork for a more expanded iteration.

Participants' apprehension to submit recorded views was a major dilemma and limitation, because it was stressful for the researcher to have to write down information, to have participants repeat utterances so that he could get them verbatim, and much time that could have been spent otherwise was spent going back and forth. But in order to achieve validity and trustworthiness, I followed the recommendation of Ivankova (2015) to have participants verify the analysis of those data. On reflection, however, participants are usually motivated to get involved in circumstances that affect them personally (Lu and Tjosvold, 2013), and the CSM Tools employees, as pointed out in the introduction, seemed unaffected by the lack of collaboration and interaction that the researcher saw and addressed through action research.

Cross-sectional data suffer from temporal limitations in that there are disequilibria in operations, and different variables are affected differently by actions taken in the organization, and hence fluctuations occur (Zikmund et al., 2015). It was obvious that working capital flow was affected during the financial crisis, and that affected or skewed movements in the supply chain activities (Wetzel and Hofmann, 2019). Hence, similar to the findings of Gill and Biger (2013), and Deloof (2003), it showed some unusual results in the correlation analysis.

5.5.2 Suggestions for Further Research

Further research involving a larger sample would be desirable to compare findings between this study and future studies. A possible study design would be to use probability sampling to reduce possible bias, and get a larger representation of participants, including some from management, so that a greater level of assurance of implementation of the findings and recommendations would be achieved.

However, as Reason and Bradbury (2001) point out, interesting findings can come from interaction with small samples in qualitative research, because of the social constructionism involved where perspectives are given by participants, rather than doing positivist research where the reliance on hard data is key, and the researcher is detached.

Even though the relationship between working capital and supply chain management has been established based on both primary and secondary data, it would have been good to see if a more robust relationship could have been achieved by examining more data under more stable conditions. Richards and Laughlin (1980), and Hofmann and Kotzab (2010) also get weak and sometimes inconclusive results in their investigation of the relationship between the functions due to interruptions in the supply chain. In the case of CSM Tools, the financial crisis played a definite role in the data history, and hence the results of this study.

Future research could concentrate on goal interdependence between the focal firm and its supply chain partners, based on reverse factoring, to see if financial performance and customer relations improve for all the firms. Reverse factoring has become a major modern-day player in the relationship between working capital and supply chain management (Wetzel and Hofmann, 2019). This should spur more interest in research on financial supply chain management that has recently come into vogue, and interdependence is the core of this new research.

Also, further research could be done involving at least two firms within the supply chain so that the findings could be compared. In that case, generalizability of the results would be more feasible.

5.6 Conclusion

This thesis proposes a new framework for conceptualizing the relationship between working capital and supply chain management, showing that teamwork, human interaction and collaboration, and knowledge-sharing are important aspects to consider in discussing functional relationships. The findings suggest that an awareness of goals is pertinent to achieving efficiency, and job satisfaction (Deutsch, 1949). However, in order to unlock the benefits that can be derived from functional goal interdependence individual differences and distrust of co-workers must be ameliorated, and the understanding that everyone should be working towards the same goals, and that the goals of the individual should be in alignment with those of the team of the organization should be emphasized.

Of course, the methodology used to study both functional and interpersonal relationships is very important. The use of the mixed methods was significant in this study to especially highlight the ability and willingness of individuals to work as team members, and the challenges that they experience in trying to work within teams. The combination of qualitative and quantitative techniques within the action research framework that brings out multiple perspectives from participants in a single study contributes to the depth of inquiry, and to the rigor and relevance that are needed to deal with the complexities and uncertainty characteristic of business today (Coughlan and Coghlan, 2002).

Extant research and the findings of this study clearly demonstrates that there is a strong inclination for inter-functional collaboration between working capital and supply chain management, and this can be extended to the broader relationship between financial management and operations management. However, that relationship cannot be determined by the usual positivistic research in which the researcher is merely a reporter, detached from the subject of the research.

The use of the mixed methods action research, which has piqued the researcher's interest, is revelatory, in that it provided the opportunity to investigate the problem from a kaleidoscopic view, showing that all parties need to work collaboratively to prescribe the corrective actions for the organization. Goal interdependence theory shows that teamwork is crucial for organizations to achieve their goals, and that when departments work independently, only inefficiency results. It is not sufficient for management to request collaboration. They should seek and maintain it. The losses incurred by the company during the financial crisis have been blamed on several factors including a lack of knowledge sharing between the finance and operations departments. Still collaboration remains a huge issue in meetings and annual reports. The President of Operations recently stated: "As this company tries to devise new reforms and strategies to the way we do business in this competitive climate, teamwork is an essential part of those reforms and of how we will be able to achieve our goals."

Thus, the mandate is there. This study shows that despite the organizational constraints, the environment is conducive to interdependent actions, but it will take an undaunted and involved reporter to initiate the process. As Porter (1998) advises, an environment may look uninviting, but making it ultimately inhabitable is the reward.

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Appendix A: Closed-Ended Questions

Q1: Our departments work together on issues

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q2 Departments blame one another when things go wrong

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q3 Management encourages cross-functional interaction

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q4 Work constraints prevent cross-functional interaction

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q5 We work together informally

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q6 We work together formally

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q7 We understand the roles and responsibilities of each department

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q8 Individuals pay attention to only what is happening in their departments

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q9 We understand why working capital is important

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q10 We understand why supply chain management is important

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q11 We understand why these two functions should work together

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q12 We share information constantly

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q13 We are empowered to make decisions with minimal conferences

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q14 I understand the goals of supply chain management

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q15 I understand supply chain metrics

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q16 I understand the goals of working capital management

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q17 I understand working capital metrics

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q18 Departmental goals are clearly defined

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q19 It is important to work towards common goals

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q20 CSM Tools is able to execute intra-firm collaboration between finance and operations

○ Strongly agree (1)

○ Somewhat agree (2)

○ Neither agree nor disagree (3)

○ Somewhat disagree (4)

○ Strongly disagree (5)

Q21 Supply chain and working capital management complement each other

Appendix A First Questionnaire (Closed-Ended

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q22 Management monitors collaboration between our departments

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Appendix B Semi-Structured Questionnaire

Interview Questionnaire for Employees in the Finance and Operations Departments Participating in the Research

Semi-structured Questions:

Respond as appropriate.

Section A: Experience

- How long have you been with the firm?
- What is your area of specialty?

Section B: Goals:

1. Should finance and operations management work together? (Explain)
2. Do working capital and supply chain management have anything in common? (Explain)
3. What are the goals of working capital management?
4. What are the goals of supply chain management?
5. Do you think about the goals of working capital and supply chain management as you perform your duties?
6. Do you now understand the connections between working capital and supply chain management? (Explain)

7. What have you gained from participating in the research?
8. How did you feel about learning about other department's activities?
9. What goals did you set yourself on entering the research?
10. Have those goals been achieved? (Explain)
11. What are some of the goals of CSM Tools?
12. How do your goals at CMS Tools relate to the goals of the organization?
13. What were some of the challenges encountered while participating in the research?
14. Do you believe cross-functional cooperation is important in the organization? (Explain)
15. What could management do to encourage interdepartmental collaboration? (Explain)
16. What are some of the impediments to cross-functional cooperation?
17. Do you believe that management should insist on job-sharing?

Appendix C Main Secondary Financial Data

Variable	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Sales	$ 3,203,878	$ 2,887,744	$ 2,863,505	$ 2,910,379	$ 2,787,122	$2,457,649	$2,355,918	$ 2,021,792	$ 1,692,041	$1,489,518
Cost of Goods Sold (COGS)	1,810,917	1,601,497	1,574,647	1,593,804	1,500,866	1,339,133	1,277,715	1,080,867	925,102	801,673
Gross Profit	$ 1,392,961	$ 1,286,247	$ 1,288,858	$ 1,316,575	$ 1,286,256	$ 1,118,516	$ 1,078,203	$ 940,925	$ 766,939	$ 687,845
Operating Profit	$ 406,189	$ 367,992	$ 371,731	$ 373,141	$ 379,525	$ 383,429	$ 412,142	$ 349,330	$ 240,828	$ 201,940
Return on Sales	0.1268	0.1274	0.1298	0.1282	0.1362	0.1560	0.1749	0.1728	0.1423	0.1356
Current Assets	$ 1,147,507	$ 1,005,579	$ 981,491	$ 1,032,076	$ 961,415	$ 893,489	$ 920,111	$ 758,434	$ 676,536	$ 682,714
Current Liabilities	$ 490,523	$ 557,725	$ 478,602	$ 422,337	$ 309,164	$ 213,579	$ 170,515	$ 172,202	$ 190,285	$ 255,838
Current Ratio	2.34	1.80	2.05	2.44	3.11	4.18	5.40	4.40	3.56	2.67
Working Capital	$ 656,984	$ 447,854	$ 502,889	$ 609,739	$ 652,251	$ 679,910	$ 749,596	$ 586,232	$ 486,251	$ 426,876
AP	$ 145,133	$ 121,266	$ 110,601	$ 114,328	$ 116,283	$ 113,636	$ 96,640	$ 95,538	$ 81,220	$ 55,345
Payables Turnover	12	13	14	14	13	12	13	11	11	14
Actual Days to Pay	29	28	26	26	28	31	28	32	32	25
AR	$ 523,892	$ 471,795	$ 392,463	$ 403,468	$ 382,784	$ 345,366	$ 297,215	$ 266,545	$ 221,013	$ 165,368
Receivables Turnover	6	6	7	7	7	7	8	8	8	9
Actual Days to Collect	60	60	50	51	50	51	46	48	48	41
Inventory	$ 518,496	$ 464,959	$ 444,221	$ 506,631	$ 449,814	$ 419,012	$ 393,412	$ 344,854	$ 285,985	$ 246,649
Inventory Turnover	3.5	3.4	3.5	3.1	3.3	3.2	3.2	3.1	3.2	3.3
Actual Days in Inventory	104.5	106.0	103.0	116.0	109.4	114.2	112.4	116.5	112.8	112.3
Days Inventory Outstanding (DIO)	105	106	103	116	109	114	112	116	113	112
Days Sales Outstanding (DSO)	60	60	50	51	50	51	46	48	48	41
Days Payables Outstanding (DPO)	29	28	26	26	28	31	28	32	32	25
Cash Conversion Cycle (CCC)	135	138	127	140	131	135	131	132	128	128
Customer Order Fill Rate	99.36	98.23	97.56	98.47	91.87	99.25	88.65	83.98	78.98	89.26
Net Income	$ 329,223	$ 231,431	$ 231,216	$ 231,308	$ 236,067	$ 237,995	$ 259,031	$ 218,786	$ 150,373	$ 125,122
Return on Revenue	0.1028	0.0801	0.0807	0.0795	0.0847	0.0968	0.1099	0.1082	0.0889	0.0840
Total Assets	$ 2,288,727	$ 2,098,912	$ 2,064,951	$ 2,101,206	$2,060,747	$ 1,943,003	$ 1,444,876	$ 1,244,423	$ 1,153,323	$ 1,157,547
ROA	0.10	0.07	0.07	0.07	0.08	0.09	0.13	0.12	0.09	0.11

Appendix D Ethics Approval

Dear Michael,

I am pleased to inform you that the DBA Ethics Committee has approved your application for ethical approval for your study. Details and conditions of the approval can be found below:

Committee Name: DBA Ethics Committee

Title of Study: The Complementarity of Supply Chain Management Practices and Working Capital Policy: Beyond Value-Creation Orthodoxy

Student Investigator:	Michael Adams
School/Institute:	School of Management Approval
Date:	27th of July 2017.

The application was APPROVED subject to the following conditions:

1. The researchers must obtain ethical approval from a local research ethics committee if this is an international study
2. University of Liverpool approval is subject to compliance with all relevant national legislative requirements if this this is an international study.
3. All serious adverse events must be reported to the Sub-Committee within 24 hours of their occurrence, via the Research Integrity and Governance Officer (ethics@liv.ac.uk)
4. If it is proposed to make an amendment to the research, you should notify the Committee of the amendment.

This approval applies to the duration of the research. If it is proposed to extend the duration of the study as specified in the application form, the Committee should be notified.

Kind regards,

Dr Hammad Akbar

DBA Ethics Committee University of Liverpool on-line Programmes

Appendix E Consent Form

Committee on Research Ethics

PARTICIPANT CONSENT FORM

Title of Research Project:	Supply Chain Practices and Working Capital Theory: A Goal Interdependence Perspective	
Researcher(s):	Michael Adams	Please initial box

1. I confirm that I have read and have understood the information sheet dated [DATE] for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected. In addition, should I not wish to answer any particular question or questions, I am free to decline.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide, and I can also request the destruction of that information if I wish.
4. I agree to take part in the above study.

Participant Name	Date	Signature
Name of Person taking consent	Date	Signature
Researcher	Date	Signature

[Version 2.1, June 2013]

Optional Statements[1]

- The information you have submitted will be published as a report; please indicate whether you would like to receive a copy.

- I understand that confidentiality and anonymity will be maintained, and it will not be possible to identify me in any publications.

- I agree for the data collected from me to be used in future research and understand that any such use of identifiable data would be reviewed and approved by a research ethics committee.

[1] *If you wish to use any of the points below add them to your main form and delete the rest*

- I understand and agree that my participation will be audio recorded and I am aware of and consent to your use of these recordings for the following purposes.

- I understand that I must not take part if... [list exclusion criteria, for example pregnancy]

- I agree for the data collected from me to be used in relevant future research.

- I understand that my responses will be kept strictly confidential. I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.

- I understand and agree that once I submit my data it will become anonymised, and I will therefore no longer be able to withdraw my data.