

SALES AND OPERATIONS PLANNING – A POTENTIAL STRATEGIC TOOL FOR THE US PAPER INDUSTRY

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ABSTRACT

The current applications of Sales and Operations Planning (S&OP), an aging consulting process, and its recognition as a meaningful strategic planning tool has led to a renaissance in its popularity and a resurgence in academic and practitioner literature. The goals of S&OP, balancing product production to sales forecasts, are pragmatic and logical. We chose to research the state of S&OP implementation within the US paper industry. We worked with representatives of the National Paper Trade Alliance to identify firms willing to participate in our S&OP study. We developed a structured interview guide that included questions related to the interviewee's experience, the firm's experience with strategic planning, and the state of their S&OP process. We utilized Grimson and Pyke's (2007) S&OP maturity model as the foundation for S&OP interview questions. We worked with six firms and one industry expert. We believe that our participating firms are not unique and that regardless of the S&OP sophistication level, improvement of the process will ultimately lead to greater profits.

INTRODUCTION

The Sales and Operations Planning (S&OP) process is a cross-functional process. Through the S&OP process, organizations strive to synchronize different functional organizational plans (e.g. sales, marketing, manufacturing, procurement, and financial) into an integrated set of tactical plans (Grimson & Pyke, 2007; Lapide, 2004). The S&OP process also can be described as a long-term planning [strategic] tool as the process exists to execute long term objectives, leading to better alignment of strategic goals with the tactical plans (Matthews & Dixon, 2016). The developed plans should support management decisions in order to balance supply and demand and provide early signals of potential imbalances (Ivert, Dubovska-Popovska, Fredriksson, Dreyer, & Kaipia, 2015). The key benefits of the S&OP process are, ideally, increased sales revenue and improved allocation of resources ultimately leading to increased profits (Cecere, Barret, & Mooraj, 2009; Godsell, Birtwistle, & van Hoek, 2010).

Sales and Operations Planning differs from the traditional planning process in three ways. First, since the S&OP process is a cross-functional process, one could argue that S&OP is simply one

more attempt to overcome the problems with functional silos within organizations. The functional silo problems are hardly new problems. Drucker discussed the “great operational divide” – the gap between operational and customer-facing employees groups - half a century ago (Drucker, 1954). Shapiro (1977) illustrated how the cultural differences between marketing and operations cause problems. Rummler and Brache (1991) used the term “the white space” to emphasize how organizational problems often occur since functions do not co-ordinate work in the processes and thus gaps exist between functions – in the white space. Hammer (1990), the re-engineering guru of the 1990s, discussed how a radical process approach was needed to solve the functional silo dilemma. Nevertheless, many firms today are still struggling with these same functional silo problems and continue to struggle to balance supply and demand. Consequently, most companies could benefit from increased cross-functional integration via a properly designed and implemented S&OP process (Wagner, Ullrich, & Transchel, 2014; Hulthén, Naslund, & Norrman, 2015).

Second, the S&OP process reviews planning activities at a higher, more strategic organizational level rather than the more operational focus of traditional planning. It also is typically conducted on a monthly basis versus the daily or weekly functional planning. This is critical as it allows companies to proactively identify and manage upcoming long-term issues such as capacity constraints, overstock situations and regional variations in demand. However, as Matthew and Dixon (2016) point out, the higher-level planning must be linked to the day to day operations for the process to be truly effective. Third and finally, in the S&OP process, senior management ideally is significantly involved in establishing consensus across business functions (Boorman, 2013). Executives must understand how the aggregated planning is designed to work and how it will influence the work within the functions. Thus, an additional benefit of a properly implemented S&OP process is faster and more informed decision-making, based on an end-to-end view of the business (Palmatier, 2016; Hulthén et al., 2015).

More than 25 years ago Ling and Goddard (1988) published their article proclaiming the benefits of S&OP. If S&OP was a person, that person would now be old enough to legally consume alcoholic beverages and would be too old to be retained on his/her parent’s health insurance policy. Thus, we can say that it is time to move S&OP out of the basement and put it to work. Today, there is renewed interest in the Sales and Operations Planning (S&OP) process. A recently conducted survey study, for example, claims that 57 percent of the studied global large-scale manufacturers had implemented an S&OP process (APICS, 2012). The increased interest in S&OP is evidenced by the numerous conferences, consulting seminars being hosted, and the increase in published academic journal articles. To illustrate, Thomé, Scavarda, Fernandez, and Scavarda (2012) claimed that the number of articles increased from less than a handful per year in the early 2000s to fifteen articles in 2010. While, most articles are written by consultants and practitioners, one could argue that the increase is an indication that the renewed interest in S&OP seems to be shared both among practitioners and academics. It has even been suggested that S&OP be relabeled as Integrated Business Planning (IBP). Reasons for suggesting the relabeling include the cross-functional emphasis of S&OP and the inclusion of the all-important financial planning aspect of the process (Matthews & Dixon, 2016).

Thus, it is not surprising that there appears to be interest among both practitioners and academics for more empirical research regarding a wide variety of issues related to the S&OP process. A

host of issues ranging from the structural to the cultural, from design to implementation, and from the issues related to top management support via cross-functional integration to measures and evidence of how the S&OP process can achieve increased supply and demand alignment. Additionally, there is a need to research the S&OP process in various contexts and industries (Grimson & Pyke, 2007; Singh, 2010; Iyengar & Gupta, 2013; Hulthén et al., 2015).

In this paper we focus on the status of and experience with the S&OP process in a traditional industry – the US paper industry. The US paper industry has often been inappropriately maligned as an old-fashioned industry, in part due to the fact that paper seems to have always been with us. It is true that paper manufacturing is one of our oldest industries and that probably 99 percent of our population above the age of six realize that paper is somehow derived from trees. However, only a small subset of that population has any idea of the technology employed in the modern paper mill. Many folks still believe that making paper both kills trees and pollutes the air and water. Business to Consumer organizations seeking to cut mailing and processing costs have been largely responsible for promulgating this myth with their misleading message that customers who discontinue paper billing are saving the environment from the evil paper companies – this “fake news” has been so bad that the US Paper industry actually supports an industry organization, “Two Sides,” that combats that myth by challenging the firms using “save the environment” argument. These challenges have gone into courtrooms and the offenders have been ordered to cease and desist.

Likewise, the US Paper Industry has and continues to primarily operate with a business model that separates the ownership of the production and distributions functions within the industry with the majority of industry players being private firms, many of which are family owned companies. Instead of being the staid traditional, natural resource destroying industry of reputation, the US paper industry is a high technology industry undergoing both structural and product mix changes. Increased competition from international competitors as well as changing consumer behaviors caused by e-communication, e-media, e-commerce, and social media are forcing the US paper industry to change how it operates. Notwithstanding the fact that S&OP has been applied in various industries for 25 years or so, the renewed focus on a more modern version of S&OP could potentially provide an opportunity for the US paper industry to better tackle its new and changing environment. Thus, in addition to exploring the current status of S&OP in the US paper industry, we also wanted to determine if the US paper industry still embraces the its traditional practices and cultures, and, if so, can S&OP adoption provide the catalyst to change the behavior of firms within the industry. The question is what does it take for this type of industry to change and embrace a potentially beneficial concept such as S&OP?

METHODOLOGY

This paper is based on a series of interviews with different companies in the US paper industry. We chose the paper industry for three main reasons. First, we have access to companies in the industry via a research institute. Second, the US paper industry is interesting as it is a traditional industry with perhaps more conservative organizational values and thus the potential for improvement via modern change approaches may be considerable. Third, the US paper industry

is an industry in decline. Thus, amid increasing innovation and global competition, the prominence of the US paper industry as a major global player is at risk. The paper industry must contend with continuously changing technology and varying degrees of protectionism. Electronic media has begun to replace newsprint (Turner et al., 2005). In our recent 2016 US Presidential election, Trump successfully used Twitter to communicate with his supporters and spent far less money on traditional media than did Clinton. Organizations are finally moving to adopt paperless office practices, some by choice and some, as in the medical environment, being required by the federal government to adopt Electronic Medical Records (EMR) systems. Change is constant; it cannot be prevented. Instead change must be expected, accepted, and embraced through technological and managerial innovation. The US paper industry of today finds itself no longer on the growth side of the industry life cycle curve. The production facilities are referred to as mills and to bring a new mill on-line requires a significant capital investment and commitment to the long-term. Thus, we believe that the firms operating within the US paper industry could benefit from Sales and Operations Planning to remain competitive in the global market.

In total we conducted seven interviews. The participating firms were identified by a representative of the National Paper Trade Association (NPTA). The selected organizations provided us with a mix of manufactures and merchants. Given the traditional nature of the industry we also wanted to include family owned as well as publicly held companies in the study. The cases also were selected based on their interest in participating in the study. The first interview served as a pilot interview to test our interview protocol. The following five interviews were conducted via video link. All interviews were recorded (video and/or audio). All interviews were then transcribed. We based our interview guide primarily on the maturity model provided by Grimson and Pyke (2007). The Grimson and Pyke model, evaluates five different organizational categories in terms of their maturity: Meetings & Collaboration, Organization, Measurements, Information Technology and finally S&OP Plan Integration. We content analyzed our data in three steps. First, we coded each transcript and conducted a within case analysis to establish the main themes in each interview. We then conducted a cross-case analysis to search for pattern among the interviewed companies. The seventh and final interview was conducted with an industry expert who also is significantly involved in the trade organization. This final interview also served as a validation of the analysis we conducted.

ANALYSIS

Our research indicates that the manufacturing companies in the US paper industry have embraced the idea of S&OP more than the distributors have. We had expected that the manufacturers, due to the nature of their operations, would be more sophisticated with regard to S&OP implementation than the distribution firms. The interviewed manufacturing firms also indicated considerable experience with the S&OP process. The distributors, on the other hand, indicated that they lacked a formal S&OP process but claimed to have informal processes that resembled the more formal S&OP process.

In terms of formal (or informal) steps of the process, all companies deviated from the formal steps often recommended in theory. It often has been suggested that the S&OP process should

include the following five major steps: data gathering, demand planning, supply planning, pre-meeting, and an executive meeting (Wagner et al., 2014; Jacobs et al., 2011; Grimson & Pyke, 2007). We can say that, of the firms included in our study, all implicitly included several of the suggested steps. We also can state that all of our participating companies have developed process versions that can be improved. One company had a process with four steps, yet the last step - a presentation for the executive committee (including CEO) - was informational in nature as opposed to a formal decision-making meeting. Another company only had two formalized steps in the process with more informal planning steps occurring within the departments. The last formal step for this company was a “weekly 30 minute information session” for executives. Both of these firms also had developed other steps or processes that to some extent related to the S&OP process. One of the firms had established a formalized budgeting process that was more influential as a planning tool and another firm had formalized brand reviews that also served as an input for the S&OP process. It is also important to note that both these companies were aware of the potential for improvements in their respective processes. The formal ranking in our questionnaire resulted in a medium ranking in terms of process maturity.

One area of potential improvement is the strategic versus operational nature of the process. As indicated above, the formal S&OP processes of the firms we studied can be described more as operational planning processes than strategic decision-making processes. The time horizon for decision making was, for instance, often just a few months. This is in contrast with theory which suggests a longer time horizon and a significant strategic focus in addition to the more operational planning aspects (Godsell et al., 2010; Milliken, 2008; Ivert et al., 2015; Thomé et al., 2012; Cecere et al., 2009). Similarly, for the companies that lacked a formal S&OP process, the existing informal processes are more operational than strategic in nature. One difference is that for the informal cases, these operational planning processes are significantly influenced by their respective budgeting processes. In one case, for example, there is a yearly budget review and then monthly “reports” that are sent from HQ to the branches. Unless there are disagreements, the branches tend to follow this report. The influence of budgeting and the finance function also is strong among the companies with a formal process. In one case, the financial plan/budget plan/forecast typically ends up being the consensus plan at the monthly decision meeting. In the other case, finance used to “own” the process and the director in charge of the process reported to finance, however, they changed the process about a year ago - the process owner now reports to the Supply Chain VP.

In theory, the S&OP process should ideally contribute both to improved operational planning as well as strategic decisions on how to better balance supply and demand in the future. It is interesting to note, however, that the formal ownership as well as driver of the process is an area that is unclear in theory. Thus, it is perhaps not surprising that the driver/ownership of the S&OP process not only varies but also is somewhat unclear where the actual ownership resides among our case organizations. Thus, on an overall level, there are issues with the formality of the process, the actual steps in the process, the maturity of the process, the ownership of the process and the issue of operational planning versus strategic decision making. While the companies with a formal structure in place have made significant progress with their S&OP processes, all case companies recognize the future potential.

On a more concrete level, there are several areas where our case firms identified future improvement potentials. These were primarily related to measurements, IT systems and

organizational structure. Regarding measurements and measurement systems, the companies described similar problems regardless of the formality of their S&OP process. It is interesting to note that these problems are well described in both S&OP literature and the measurement literature. For instance, all of the firms we studied indicated that they collect many different metrics yet that they are unsatisfied with the overall measurement system. In fact, most of our study companies emphasized the lack of structured key performance indicators (KPI) as well as a balanced measurement system. In one company, for example, acquisitions made them aware of this particular problem. Given that the term S&OP process performance is not clearly defined in either academic or practitioner literature, a standardized approach to systematically evaluate S&OP process performance does not exist (e.g. Ivert & Jonsson, 2010; Grimson & Pyke, 2007). Furthermore, while research offers a large number of measures, the suggested measures tend to focus on the performance of functions rather than on the performance of the cross-functional process (Cecere et al., 2009; Grimson & Pyke, 2007; Thomé et al., 2012). Consequently, a common drawback of many organizations is the application of too many measures without focus on cross-functional integration.

All of our study companies stated either explicitly or implicitly that they generate many reports but felt that they were lacking in report analysis and consequently metric driven actions were limited. Neely (1998), one of the leading researchers in the business performance measurements field, described this issue as “the ultimate sin.” As a result, our study companies have limited awareness of how good their actual S&OP processes are. In concrete terms this means that they do not know the accuracy of certain input parameters as well as the results of the process. Other issues concern the transparency and the overall condition of the process. In short, the companies lack awareness of how efficient and effective the S&OP process is. As a result of this problem, measurements were the number one concern in the continued work on improving the S&OP process in one company. In another company, they stated that work with KPIs are “an on-going process” and “can take years.”

Related to the issue of measurements is the issue of IT systems. One of the firms in our study had multiple IT systems from which they were required to pull data, a task they described as “not that easy.” In fact, all the firms included in this study acknowledged IT issues; issues that included working with prior generational legacy systems that presented unique challenges, manual data entry and the associated error introduction, and the compartmentalization of institutional knowledge that makes it difficult to generate accurate and timely data and also creates transparency problems. Hulthén et al. (2015) recently discussed the consequences of interfacing the lack of standardized S&OP measures with less than adequate supporting IT systems. The combination creates problems in terms of transparency and comparability which can lead to biased decision making. Hulthén (2015) found that firms acknowledged the difficulty of synchronizing key indicators with business strategy and reward systems. Likewise, all of the firms in our study disclosed that they were in some stage of developing or replacing their ERP systems. In one case they stated we “are about to start work on [replacing our] ERP.” Another said “[a replacement] project for a new ERP system may be years away.” Another firm stated that they had just dumped the ERP system that they had spent the last six years trying to implement to temporarily return to their old legacy system. Still another mentioned that their current focus was the development of a Business Intelligence/dashboard system.

Finally, we noticed that most companies in our study mentioned that lack of cross functional integration was an issue. The so called functional silo problem is well known and despite decades of efforts to eliminate this issue, methods such as six sigma and lean seem to have failed in making organizations less functionally dependent. This is one explanation for the renewed interest in S&OP. However, while S&OP supports cross functional integration, the issue of measures is an area that needs to be improved in order to support the S&OP vision of cross-functional integration (Keal & Hebert, 2010). Given these issues, it is not really surprising that the companies we interviewed take an intra-organizational approach to S&OP. Not one company included suppliers or customers in the process even though some literature indicates the potentially positive impact on the S&OP process (Wang, Hsieh, & Hsu, 2012).

In the analysis of S&OP in the US paper industry, an obvious conclusion is that an improvement potential exists in the Paper industry. While the level of experience with S&OP varies, all interviewed organizations indicated that the process governance and structure could be further refined. In general, the manufacturer was more familiar with this type of planning and had procedures in place that resemble the theoretical descriptions of S&OP. However, the paper merchants' processes tend to be more of a backward review than a forward planning process. On the other hand, since merchants do not manufacture products, they do not have the same production capacity issues that their suppliers have. The contrast between the informal planning of the merchants and the more formalized processes of the manufacturers could in part be explained by the fact that most merchants are less capital intensive, privately owned. Still, as the seventh interviewee pointed out, both merchants and manufacturers are likely to benefit from a formal planning process such as S&OP. Similarly, while the maturity levels of our study firms vary, the experienced companies utilizing somewhat mature S&OP processes share fundamental challenges with the less sophisticated firms that hinder future process refinement. In some cases, these issues are not related to the S&OP process, instead they are related to issues with a broader scope for the organizations. Examples include Information Technology and performance metrics. For these reasons we have focused the following sections on three segments which could be helpful for paper industry firms moving forward with increased S&OP utilization:

- Implementation and governance
- IT systems and software programs
- Key Performance Indicators (KPIs)

IMPLEMENTATION and GOVERNANCE

The first aspect we focus on is implementation and governance. There are several frameworks and maturity models (see e.g. Grimson & Pyke, 2007; Lapide, 2005; Muzumdar & Fontanella, 2006; Wagner et al., 2014) that can assist organizations developing S&OP processes.

It is important to carefully design how the process should be structured, yet, again, existing maturity models and frameworks can assist with this particular part.

S&OP has been described as roughly 60% change management, 30% process, and 10% technology (Iyengar & Gupta, 2013). Thus, an implementation of S&OP is not all that different from the implementation of any other organizational change effort. It should be remembered that most change initiatives are not very successful. According to one study published in 2013, only 25 percent of change management initiatives are successful in the long-term (Towers Watson, 2013). Over the last few decades, numerous studies of critical success factors (CSF) for the implementation efforts of various organizational change programs have been published. Naslund (2013), for example, provides a review related to lean and six sigma efforts and structure the CSF in three categories; purpose, process and people. Naslund (2013) further argues that to some extent the purpose factors are a prerequisite for the process factors which, in turn, serve as a prerequisite for the people factors. In other words, even though the people factors may be the most challenging factors, the program will most likely not succeed if it is not started for a good reason and aligned with the organizational strategy. Similarly, without a solid process orientation and structure, focus on the people issues will not be enough to guarantee success. Thus, organizations need all three categories in place: purpose, process and people. Finally, Naslund (2013) argues that the CSF for most programs are similar and that they have not truly changed over time. Thus, organizations striving to implement an S&OP process can learn from success and failures from other change related programs. This can be important to keep in mind as S&OP, given its relative novelty in terms of popularity, is a field which lacks in-depth empirical research regarding implementation successes as well as problems.

Governance begins with planning including defining who will do what, when, where, how, and why. Plan the work; then work the plan is good governance according to Iyengar and Gupta (2013). Governance is an ongoing process with continuous evaluation of organizational outputs and the results of the S&OP processes itself. In addition to defining process ownership, S&OP process governance needs to reflect what ownership and process governance mean to the organization. The process owner is responsible for bringing all the independent roles and functions out of their silos, while staying within the agreed upon rules and expectations. Given that aligning the different functional silos within an organization can be difficult, the process owner must be a “champion” to unite the organization under the new S&OP process (Boorman, 2013). This champion should be stakeholder in the business and hold considerable clout within the ranks of the organization. Given the functional silo phenomenon, it may be a good idea to select a high-ranking individual without a functional responsibility. The Supply Chain VP could be that person (Boorman, 2013). Matthew and Dixon (2016) suggest that the executives need to own the process but not necessarily drive it. An APICS (2012) study indicated that the head of the Supply Chain function was in charge in most cases. The process is then carried out by what can best be described as a cross-functional planning team comprised of mid-level managers and analysts (Stahl, 2010; Wagner et al., 2014).

Groenewouth (2009) states that an effective S&OP process is based on three pillars where adapting to organizational structure and aligning functional tasks and goals constitute the first two pillars. Yet, the third pillar and most important factor, according to Groenewouth, is to make the people involved in the process successful. Members of the organization must feel like they have a stake in the success or failure of the process. Similarly, Mansfield (2012) offers that managing change is an integral component of a successful S&OP implementation. The S&OP process demands significant change from a broad to a granular level. In order to achieve S&OP

success the team must reconcile all demand and supply plans at both the detail and aggregate levels and remain synchronized with the overall business plan (Blackstone & Cox, 2005). Successful implementation of an S&OP program requires that management induce small behavioral changes upon the individuals that act upon and/or are acted upon by the S&OP process to create the large-scale organizational culture changes. Because change is almost always met with resistance it is essential that S&OP *Champions* anticipate roadblocks and prepare accordingly. This requires *Champions* to communicate effectively with key stakeholders.

The silo mentality typically found in all institutions and the cross-functional nature of the S&OP process will likely create pockets of conflict when S&OP is introduced into an organization that if not managed effectively may lead to open hostility, programmatic sabotage and the ultimate failure of the S&OP initiative. Demolishing silo walls is a both a structural and cultural challenge for most companies. The challenges are especially visible in interfaces between functions – the white space according to Rummler and Brache (1991). The white space between sales and manufacturing is often seen as being particularly difficult. Not only do these groups see the world differently, but they often have different goals and they are motivated to achieve them in different ways (Lawrence & Lorsch, 1967; Mello, 2010; Shapiro, 1977).

Probably all business students have been subjected to the traditional case of sales verses production or the story of intra-firm goal conflict. Sales people are motivated to sell, to increase revenue and thus, to be responsive to customer demands. They want a wide variety of available products to sell. Production managers are typically evaluated on production efficiency, which leads to a preference for narrow product scope and lower inventory levels (Singh, 2010; Oliva & Watson, 2011). In addition, marketing managers have typically risen up through the sales ranks while plant managers come from the production culture. Culturally, these groups think differently, speak differently, process information differently, and solve problems differently (Shapiro, 1977). This is the phenomenon Drucker (1954) called the “great operational divide” within organizations – causing goal conflicts and other problems as a result. In fact, it is an easier task to effectively communicate with someone who speaks a totally different language and to reach a common agreement than it is to reach an agreement between individuals that embrace opposing values. Once established, values are almost never changed.

One suggestion to mitigate potential conflict is to evaluate the *current state*, calculate the *impact* that will result from either not changing or not managing the change, and create a vision for the expected *future state* (Mansfield, 2012). This kind of scenario planning has long been an important tool in the strategic planner’s toolbox and again draws attention to the strategic nature of S&OP. An example of a common change management issue that can potentially derail an S&OP process is the common sales practice and prevalence of use of under-promising and overachieving on forecasting. Obviously, the sales professionals either never took a Principles of Management class or slept through the lecture on budgeting and forecasting because, as everyone should realize, overachieving is every bit as bad as underachieving. This phenomenon is representative of a cultural issue in which stakeholders feel incentivized to surpass established sales targets. It is common for sales forecasts to be underestimated which consequently negatively impacts the reliability of the production forecasts, causing the wrong amount of product to be produced. The current state is that all too often stakeholders are incentivized to forecast below their true estimations to ensure they meet their declared, specified target.

The impact of lowballing the sales forecast affects the integrity of the process itself and potentially compromises the outcomes intended by the S&OP process. The future state of the change should incorporate a new metric to drive a cultural change in the way stakeholders view the forecasting process. The new forecasting goal would be to come in under or over (+/-) target by a certain percentage rather than beating an established goal each month (Mansfield, 2012). By initiating such a change, management is incentivizing participants to employ more accurate forecasting techniques. Management can support the change by rewarding stakeholders for accurate forecasting. In this scenario, S&OP leadership would encourage both a behavioral and cultural change within the organization to promote firm/team performance, not silo maximization. By collaborating with stakeholders and uniformly evaluating changes, S&OP can promote communication and tear down the organizational silos. Boorman (2013) emphasized the importance of change management in implementing the S&OP process. Similar to the CSF in other change initiatives (see e.g. Naslund, 2013), Boorman discusses aspects like top management and employee buy-in, various forms process education and the importance of building the case for the new initiative, sometimes referred to as the burning platform.

IT SYSTEMS and SOFTWARE PROGRAMS

IT systems and software programs can be used as key enablers in the S&OP process, especially for the more advanced and mature S&OP firm (Kaipia, 2014). According to one IT/SOP study as many as 60 percent of the responding companies utilized specific S&OP software programs, while roughly 25 percent used their ERP systems. The remaining 15 percent made do with spreadsheets. The study also found that as many as 20 percent of the participating firms were unhappy with their S&OP software solution. Not surprisingly, the least satisfied firms were those using non-dedicated software systems or spreadsheets (Smith, 2008). On the other hand, for the less mature S&OP companies, focus should be on the S&OP process rather than on sophisticated technology. For these early stage S&OP companies, spreadsheets, such as Excel, usually work well (Westerveld, 2009; Kaipia, 2014).

Excel is common as a first choice due to its flexibility. Sodhi and Tang (2011) argue that it can be a truly useful and compelling tool, especially for small data sets. However, for the long term and for more mature S&OP processes, it is not a viable tool. Excel is too much of a blank slate and fails to provide guidance as to how to design the S&OP process. Other spreadsheet flaws include their fragility, scalability limitations, and the black box nature of spreadsheet ownership that leads to limited replicability if the original spreadsheet developer/owner leaves the firm (Westerveld 2009). Furthermore, Excel's ability to handle all the different data that needs to be integrated is limited. Bursa (2011) claims, and we agree, that spreadsheet utilization and dependence maybe one of the reasons why many people consider S&OP to be a difficult process. Bursa (2011) states that a successful tool requires that all data gathering is streamlined in a time phased plan to make it possible to model many different scenarios. That goal can't be reached in an efficient and effective way only using spreadsheets.

S&OP can be effective in acquiring data from cross functional departments because it incorporates procurement, production, distribution, and sales in the decision-making process

(Wang et al., 2012). The data provided by these functional units is recorded to create the Master Data for the S&OP process. The type of information included in this repository can include purchasing costs, supply capacity, lead time, production costs, cycle times, inventory costs, transportation costs, exchange rates, customer demand, product pricing, due dates, and many other aspects of firm operations (Wang et al., 2012). This data is then utilized in the S&OP decision model to discuss assumptions, parameters, decision variables, and constraints.

Since ERP systems were developed to integrate the information flows between functions within a company (Taylor, 2016), they also may play that role for S&OP processes. For S&OP planning, the output of an ERP system can be utilized throughout the entire process. For the first two steps of the typical five steps of the monthly S&OP process, different modules of ERP systems can be used to enhance sales and demand forecasts. This information can then be further used in the ERP system to generate capacity and material requirements for the third step of the process. The fourth and fifth step of the S&OP process requires pre and executive S&OP meetings with cross-functional teams. It is crucial to have a system that ensures that the sales, operations and financial plans are aligned and provide an overview of the activities within the company. Thus, combining the different applications of an ERP system can work well for the S&OP process (Sides, 2012). ERP systems as S&OP solutions do have limitations; thus, the market for Vendor provided specific S&OP software solutions is increasing. S&OP software solutions exist as stand-alone, dedicated applications or as software service setups. Several companies have developed their own in-house S&OP software programs. According to Gartner research, the leaders for S&OP software are Kinaxis, Steelwedge, JDA, Oracle, SAP and Quintiq. Logility, River Logic and Arkivea are mentioned as challengers (Payne, 2015).

PERFORMANCE MEASUREMENT SYSTEMS AND KEY PERFORMANCE INDICATORS (KPIs)

Key Performance Indicators (KPIs) are metrics used to evaluate the success of an organization, its processes, projects, functions, etc. The development of meaningful KPIs is one key component of the implementation of Sales and Operations Planning (Dietz, 2015). While various authors provide many different KPIs that companies may choose from, the problem is the lack of performance measurement system for the S&OP Process (Hulthén et al., 2015). Ironically, the problems with lack of performance measurement systems is not limited to the S&OP process but is rather a universal, strategic problem for organizations.

A recent review of the performance measurement literature found that current problems are similar to those organizations experienced decades ago (Yadav & Sagar, 2013). Despite the numerous theoretical frameworks that exist, organizations still struggle to develop and implement cross-functional measurement systems that are aligned with organizational strategy. Organizations tend to measure anything and everything that lends itself to being easily measured whether or not the resulting metric is relevant. The problem is not that organizations do not measure, rather they tend to measure too much. In addition, these measures are primarily functional in nature and although they tend to result in numerous reports, actions based on the measurements are less common. Neely, Bourne, and Kennerly (2000) called this phenomenon

the ultimate sin already in 1995. We take this a step further and believe that the vast majority of KPI or performance metrics captured by organizations are of limited value operationally and even less value strategically.

A review of the literature furthermore indicates that, from a research perspective, there is a lack of empirical studies focused on the implementation, evaluation and continued development of measurement systems. There are, however, a multitude of articles that provide suggestions for measurement systems and KPIs, yet, again, these are primarily conceptual articles. The issue of measuring and a measurement system for the S&OP process is consequently a complicated area that requires significant additional research. Thus, it should not just be an area of interest for the US paper industry but rather for all organizations in all industries.

CONCLUDING DISCUSSION

While some firms in the US Paper industry have embraced the idea of S&OP, others have not begun this potentially rewarding journey. We found that even those companies that have a formal S&OP process lack in terms of process maturity. Thus, we believe the potential for further development is significant for all companies in the industry. We suggest that firms implementing S&OP processes begin reaping positive results immediately and that as firms refine their S&OP processes, benefits will continue to increase. Yes, we are speculating, but the positive if qualitative comments from our study participants support our assertion. Potential S&OP benefits exist for all firms within all industries, however, we specifically propose that firms competing in industries typified by the US paper industry. The benefits of S&OP can lead to core competency in forecasting and thus at a minimum a temporary competitive advantage. The difficulty firms seem to confront breaking down their silo walls suggests that successful firms may actually gain a sustainable competitive advantage.

The US paper industry has been in a consolidation phase for well over a decade and as part of that phase less efficient mills have been shut-down. Product mix in the “fine paper” market has changed with the US fine paper firms abandoning the uncoated sheet (copy paper) market to increased foreign competition. Old standby products like newsprint and cigarette paper and filters have become less of a staple for US paper producers due to changes in social behavior. Social behavioral changes also have influenced communication including knowledge repository and transfer, and shopping behavior. S&OP make it possible for firms to operate profitably in a changing, and challenging environment.

S&OP provides a good foundation with a cross functional view and thus, the problems with functional silos and the resulting inefficiencies can be decreased, leading to increased profits. On the other hand, as our more broad research indicates, these issues are far from unique to the paper industry. Thus, the paper industry can learn from research within its industry as well as from good examples from other industries. The three main streams of research we recognize as being critical to successful S&OP implementation includes change management issues as related to implementation and governance of the S&OP process, information technology and software program aspects and finally, the performance measurement aspects which should both focus on

key performance indicators (KPI) and a cross-functional, balanced measurement system in order to capture both the results of the process as well as the performance of the process itself.

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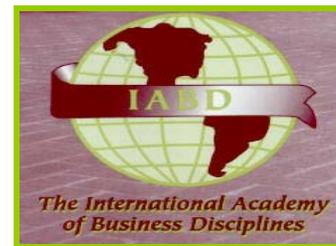
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