

Organizational Key Job Scopes In Demand Planning Of Selected Countries

Ting Huat Tie¹, Prof. Dr Oo Yu Hock²

¹Associate Researcher, GARA Malaysia Chapter

²Deputy Vice Chancellor (International) Alfa University College, Subang Jaya, Malaysia.

ABSTRACT

Demand planning is a supply chain management planning that enables an organization to forecast the future demand for its products or services to be produced efficiently and delivered effectively to the satisfaction of its customers. And supply planning is the management of the inventory supply to meet the demand forecast targets macro, industry and firm levels during distribution, manufacturing, and procurement operations within the capacity constraints and material availability of the organization. Therefore, the key performing indices (KPIs) are designed to provide up-to-date market intelligence about activities that are critical to planning, particularly in gauging the mean absolute percentage error results of demand planning. This study attempts to establish the extent of key job scopes in demand planner and how true the subject matter experts in demand planning function follow the job scopes as defined. The qualitative design approach, limiting the population to selected countries by choice, employs three categories of data sources: themes synthesizing, semi-structured interview and three ways of LinkedIn profiles review. The triangulated interview findings, confirming the key job scopes practiced by demand planners in the organizations, show the overlapping of demand planner job scopes by a mixture of other roles other than that of the demand planning role. In conclusion, 227 LinkedIn profiles of subject matter experts from 30 countries were found having the demand planning working experience mixed with supply planning or other supply chain functions.

Key words: demand planning, supply planning, key job scopes, KPIs, subject matter experts

I. Introduction

The role of Demand Planner, increasingly receiving more attention by some organizations in Malaysia to restructure their functions, is creating a demand for skill-competency candidates in demand planning since the advent of COVID-19 pandemic year 2020 (Hays, n.d.). However, there are few studies available to support this demand planner key-job scopes. Hence, the two outstanding research questions seek answers to highlight the significance of this study that all trade-business organizations especially multinational corporations (MNCs) have demand planning functions with precise key-job scopes to maximize their value-adding, and to facilitate their value-creating, activities for more productive returns and better improved returns on investment (ROIs) respectively. A notable feature has been the distinction between demand planning and supply planning which, according to available blog posts, is attributable to factors such as confusion (admin, 2021), overlapping (Demand Solution, 2020) and conflict (webdevelopers@versacreative.com, 2021). Nevertheless, the integration of demand planning with supply planning is to achieve continuous balance in

supply chain management (SCM) through S&OP (Demand Caster, 2019). The review of literature mainly highlights the substantive characteristics for the 'three data sources' used to justify the employment of the research methodology.

II. Review of Literature

According to Rashid et al. (2019), multiple data sources can be used in qualitative case study that is most suitable for exploring and understanding the phenomenon. In order to answer the second question in this study, the qualitative case study is adopted and triangulation employed to collect and analyze the data from three categories of data sources to arrive at a conclusion of the phenomenon (Harrison et al., 2017). The pertinent areas of literature review concern the research methodology used to analyze the available data and information that form the themes synthesized from three sources - blog posts, semi-structured interview triangulated responses, and LinkedIn profiles review respectively known as first data source, themes synthesizing, second data source, semi-structured interview, and third data source, LinkedIn profile review.

O'Reilly and Kiyimba (2015) had explained the 'first data source, themes synthesizing' as the analysis of workable data collection from primary and secondary sources, the former consists of the report of study by original researchers, and the latter provides a reviewer's summary or description of an original researcher-work assessed, an opinion shared by Ramdhani et al. (2014). However, according to Adams, Smart and Huff (2017), when an applied topic area shows lags of scholarship, grey literature can be incorporated with articles for extending its scope. The grey literature documents, without meeting the normal stringent academic process but complying with standard operating procedures (SOP) commercial publishers, such as blog posts research, are examples used for secondary data analysis (Oliver, 2012; Blom, 2017). Four contemporary research topics of demand management, demand planning, demand chain management (DCM) and S&OP are available in some primary and secondary articles, without mentioning demand planner job scopes which are mentioned in blog posts. Nevertheless, according to Onwuegbuzie, Leech and Collins (2012), the analysis of themes can be used in synthesis research whose method is to synthesize 36 themes collected after completing the summary of 29 materials in primary and secondary articles from blog posts. Appendix 1 shows a list of detailed materials with themes extracted from each summarized material. The synthesis matrix constructed in Appendix 2 connects the themes to define demand planner key job scopes and identify supply planner job scopes.

According to 'second data source, semi-structured interview', the defined demand planner key-job scopes are used to design interview questions sent via LinkedIn and email. LinkedIn has advanced search function and the data can be used for pre-interview, thus making LinkedIn a tool for professional networking and research purpose (Schneiderman, 2016). According to Burns (2010), the email interview for qualitative research is developable, and the data quality collected via asynchronous email interview is very similar to physical interview (Ratislavová and Ratislav, 2014). Bampton and Cowton (2002) had contended that the e-interview is a complementary method to physical interview, and Bampton, Cowton and Downs (2013) had attested that there are advantages with this method, such as significant time saving and financial resources saving when conducting interviews with research subjects in different locations of a city or a country. The interview data to be analyzed to determine how closely demand planners actually follow the defined key-job scopes in this study.

Regarding the 'third data source, LinkedIn profile review', according to Robinson (2021), provide researchers with a broad accessibility to the interviewee pool, but there is no guarantee that the interviewees will agree to participate the interview. However, on the issue of a combination of research methods through triangulation, according to Bekhet and Zauszniewski (2012), they are able reduce the weaknesses of an individual method and increase the validity of the study. To strengthen the methodology of this study, the subject-matter expert profile in LinkedIn provided the database to research information on job titles with or without job descriptions but having working experience in demand planning. The 3-way profile review consisted of an overall review, a profile review on employees of ABC Organization in different countries, and a profile review for employees of XYZ Organization in different countries under one-same leadership. These profiles excluded other job titles with job descriptions to lead or manage demand and supply planning teams except those job titles as planner or planning in supply and demand or only as demand planner or planning.

III. Background of the Study

As an organization's supply chain management process to project future demand and successfully customize its projected product and services (output), demand planning involves three macro-industry-company levels of preparing data, initial forecasting and incorporating market intelligence in alignment with prevailing economic conditions, industrial production status and national income allocation respectively. Demand planning is a supply chain management planning that enables an organization to forecast the future demand for its products or services to be produced efficiently and delivered effectively to the satisfaction of its customers. And supply planning is the management of the inventory supply to meet the demand forecast targets of the three macro-industry-company levels, within the capacity constraints and material availability, during procurement, manufacturing and distribution operations of the organization respectively. The key performing indices (KPIs) therefore are designed to provide up-to-date market intelligence about activities critical to planning, particularly in gauging the mean absolute percentage error results of demand planning.

Even though demand-chain management is similar to supply-chain management, the focal-emphasis of the former is on consumer pull and the latter is on supplier push. In essence, the demand chain, on the one hand, commences with customers and follows through a network of resellers, distributors, and other business

partners who acquiesce to sell the organization's products and services. Supply chain management, on the other hand, is the process that enables the organization to forecast its future demand, thus successfully customizing its projected products and services (outputs).

IV. Statement of the Problem

As demand management formulates an action plan to meet current and anticipated conditions in target markets to effectively estimate future product demands including planning inventory flow, analysing statistical data, and generating forecasting solutions, supply management drives the demand and inventory levels to maximize cash flows, and sales and services levels. However, the functional responsibilities in both demand and supply management tend to overlap and cause disruptive dysfunctional operations unless the key-job scopes of the demand planner is distinctively defined.

Without a clear definition of the key-job scopes for demand planner, the prevailing influence of performance-result factors such as confusion, overlap and conflict elements continue to hinder the productivity achievements and outcome expectations of demand planning, and prolong the role-disruption of the demand planner. The resultant impact is the enfeebling of organizational competitive advantage and gradual diminishing of trade-business profitability for the management and stakeholders of the organization.

V. Research Questions

1. What constitutes the key-job scopes and its extent thereof in demand planner?
2. How closely do the subject matter-role player experts in demand planning functions follow the defined key-job scopes in reality?

VI. Objectives of the Study

1. To ascertain what constitutes the key-job scopes and its extent thereof in demand planner.
2. To discuss how closely the subject matter-role player experts in demand planning functions do follow the defined key-job scopes in reality.

VII. Scope and Limitation of the Study

This study attempts to seek answers to clarify the lack-areas of key-job scopes in demand planner while alluding to the efficacy or inefficacy of its management functions only. In order to achieve the objectives of the study in

alignment with the research questions asked, this effort is inherently limited by an association with the employment of the current research methodology; the latter advocates the use and analysis of available data and information constituting the themes synthesized in blog posts and the semi-structured interview triangulated from the LinkedIn profiles review. As such, from the perspective of execution, for non-premium members, there are few limits set by LinkedIn including a one-week period-limit for new request connection, and also an after-connection limit for sending messages on total advanced search within a month. All these posed challenges for new connections to be approved, with restrictions for more interview access and more profile- review. However, the LinkedIn profiles review is limited to only job titles as planner or planning in supply and demand or only as demand planner or planning; other job titles with job descriptions to lead or manage demand and supply planning teams are excluded as source of profile review in this study.

VIII. Significance of the Study

The finding-results of this study in some ways can add insightful information to the paucity of research database on the lacking areas in the key-job scopes of demand planner. The inherent weaknesses of using secondary data/information sources in an ex post facto analysis-approach can be further improved in future. It should encourage interested researchers in similar research to delve into this subject with more quantitative and qualitative methods to generate primary databases in order to build a reference-treasury of applicable techniques to update knowledge and upskill competencies on key-job scopes of demand planner and supply planner, including their respective management functional responsibility-output as well.

IX. Key Terms Defined

- a) **Demand Planning** – This is a process in the supply chain planning for forecasting a product or service demand to be produced and delivered more efficiently to the satisfaction of customers. It involves three basic steps, that is, data preparation, initial forecasting and market intelligence incorporation.
- b) **Demand Planner** – A professional whose role in the supply chain of an organization or firm requires him or her to use analytical, marketing and sales data to estimate and project the future product or service demand for his or her

- company. His or her job description and responsibilities include planning inventory flow, analyzing statistical data, and generating forecasting solutions.
- c) **Demand Chain Management – DCM refers to** the management of relationships between suppliers and customers to deliver the best cost-demand value especially to the customer throughout the entire demand chain. The main components of demand chain management are forecasting, supply planning, demand analysis and sales and operations planning.
- d) **Supply Planning – This** is the entire planning process of procurement, manufacturing and distribution operations based on demand forecasts within the organization's capacity constraints and material availability to meet product or service demand satisfactorily. This involves maintenance and stock policies, production and sourcing parameters such as lead time and minimum order quantities as manifested in vendor-managed inventory, strategic partnerships with suppliers and third-party manufacturers, inventory visibility, and flexible manufacturing to minimize the effects of demand volatility.
- e) **Supply Planner –** Also known as supply chain planner, he or she forms a vital part of the logistics department of an organization. His or her job function is to plan, purchase and manage the continuous flow of materials and supplies, that is, anytime available inventory to anticipate and maintain stock levels to ensure the organization's business runs uninterrupted.
- f) **Supply Chain Management – SCM,** a forward-looking process of coordinating organizational assets including materials, labor and facilities, refers to the network of organizations, people, activities, information, and resources involved in delivering goods, services and information from supplier to customer, thus balancing supply and demand. The logistics in SCM therefore focuses on the efficient and cost-effective delivery of goods to the customer.
- g) **Difference between DCM and SCM – DCM** as a pull factor emphasizes customer-centric products or services as and when on-demand occurs. SCM as the push factor ensures that an effective inventory of available-ready stocks to meet on-demand purchases.
- h) **Confusion –** It refers to a state in demand forecasting in which the only thing that is consistent about retail is its inconsistency. Consequently, this requires a fragmented approach to identifying and accounting for relevant factors peppered with uncertainty and doubtful accuracy. For example, analysis of questionable factors that contribute to the product demand in a product life cycle (PLC) can affect its replenishment planning and jeopardize adequate inventory in the right locations in sufficient quantities to meet the demand. In short, changing patterns in lifestyles and livelihood sources tend to make identification and prediction turning-points the most difficult aspects of forecasting. Even though past-events knowledge may help to identify cycles, but sometimes the cycles do not necessarily repeat them.
- i) **Overlap –** Economic forecasting by itself is inadequate because other contingent factors of politics, culture and health, among others, are its overcasts that do generate unintended consequences as well. In addition to the confusion of non-repeating cycles of demand and disrupted inventory planning, the current overlapping influences of economic impact and speed of policy changes under the COVID-19 pandemic and its spawning viruses are undermining the reliability of economic and historical data that compel economic and other discipline forecasters having to delve into the uncharted realm of epidemiology and humanistic sociology.
- j) **Conflict –** Given the confusion and overlap scenarios that directly and indirectly affect the demand and supply chain planning and management, the law of supply and demand is a timely reminder of status quo and conflicting interests between the producers and the consumers, especially the interaction between the buyers of a resource and the sellers for that resource, premised on the price of a given product or service and the willingness of people to either buy or sell it respectively. In this instance, price fluctuations due to real or artificial shortages tend to raise irksome reactions that often manifest into open conflict

or/and muted sabotage in the public interest. The current global economic and geo-political situations are conflict-driven instances that challenge the wisdom and rationale of objectivity and long-term forecasting of demand-supply planning and management for stable and staple human consumption worldwide.

- k) **Macro-Industry-Organization Levels:** The words ‘organization’ and ‘firm’ are used interchangeably to mean ‘the company’. The three levels refer to country or society environment, the industry or business environment, and the internal-external operational milieu of the company. Prevailing economic (including political) conditions circumscribe the macro level of influences which tend to affect the procurement, manufacturing and distribution operations of the industry level and subsequently, impact on the demand-supply planner and management of the organization or firm level.

X. Research Methodology

Since the ex post facto purpose of the study is to achieve a twofold objectives of ascertaining that which constitutes the key-job scopes and its extent thereof in demand planner, and to discuss how closely the subject matter-role player experts in demand planning functions do follow the defined key-job scopes in reality, the most convenient approach is to access available databases that provide secondary information in the internet sources. In this case, blog posts with contemporary researches are used to define the key job scopes in demand planner, and the 325 LinkedIn profiles of 31-country review provide the input responses on how closely the subject-matter experts in demand planning function follow the key-job scopes defined. Even though, an original value in this manuscript suggests that the phenomenon of supply planning role or others mixed in demand planning role in some countries is common, the three elements or factors of confusion, overlap and conflict within the three macro-industry-organization levels of procurement, manufacturing and distribution operations within the organizational capacity constraints and material availability must be duly addressed and resolved to avoid disruptive functionality and productivity.

XI. Finding-Results Analysis

A. Themes and Synthesizing:

The Main Theme – Integrating Demand and SCM

The first significant theme on “integrating demand and SCM” was found in the study of demand management (Melo and Alcantara, 2016; Croxton et al., 2002; Lapide, 2006; Melo and Alcantara, 2014; Smellie, 2012), demand planning (Vlckova and Patak, 2010), DCM (Jüttner, Christopher and Baker, 2007; Madhani, 2016; Vural, 2015; Anning, Okyere and Annan, 2013), S&OP (Shedlawski, 2017, p. 6), and the blog posts of demand planner role (John Galt, n.d.; Demand Caster, 2019), with emphasis on demand generating in marketing (Madhani, 2016). The SCM integrated with demand can be understood as the supply chain functions integrated with marketing. In this integration, the well-managed SCM function for demand-generating market is to meet customer expectations. Thus, the SCM is added as an integral part of the process or component of demand managing process (Melo and Alcantara, 2014; Croxton et al., 2002) or of the supply chain functions driven by demand (Madhani, 2016; Bumblauskas, Bumblauskas and Sapkota, 2017).

The study of demand planning by Gayialis et al. (2013) has revealed two processes to manage demand through demand management as follows:

1. Demand Planning - The theme of demand planning was mentioned in studies on demand planning (Vlckova and Patak, 2010; Le Gia and Dang, 2021; Venkatadri, Wang and Srinivasan, 2021; Matopoulos, Ranitovic and Bournakis, 2012; Merkurjeva, Valberga and Smirnov, 2019; Swierczek, 2020). The theme of demand planning in other study: DCM (Jüttner, Christopher & Baker, 2007) and S&OP (Kumar, 2016). In the blog posts, it is linked to the demand planner as a role player in the demand-planning function of the organization (John Galt, n.d.; Demand Caster, 2019; webdevelopers@versacreative.com, 2021; Demand Solution, 2020; admin, 2021).
2. Demand Forecasting - Jüttner, Christopher and Baker (2007) had asserted that the accuracy of demand forecasting can be increased through the integrated demand and supply chain of DCM. Wijkstra (2020) later reiterated that the crucial role of demand-forecasting accuracy in mitigating risks can be created by as demand management through S&OP. Kumar (2016) had asserted earlier that producing a demand plan in demand planning is part of S&OP process, accomplished by reviewing and making comparisons

between demand forecast, sales data and promotional plan in marketing. Other materials on this subject include topic-articles on demand management (Melo and Alcantara, 2016; Croxton et al., 2002; Lapide, 2006; Melo and Alcantara, 2014), demand planning (Vlckova and Patak, 2010; Merkurjeva, Valberga and Smirnov, 2019; Swierczek, 2020), and blog posts sources (John Galt, n.d.; Demand Caster, 2019; webdevelopers@versacreative.com, 2021; Demand Solution, 2020; admin, 2021).

In summary, demand management, DCM, demand planning and S&OP are four research topics on demand managing by demand planning and demand forecasting with the supply chain functions integrated with marketing. S&OP is used to support demand management by using demand-planning to bridge the marketing and supply chain functions (Melo and Alcantara, 2016; Lapide, 2006; Ali et al., 2018; Melo and Alcantara, 2014; Gligor, 2014; Vlckova and Patak, 2010; Anning, Okyere and Annan, 2013). This summary is significant because it synthesizes the themes collected from blog posts materials to define the demand-planner role in demand planning function in order to manage demand by integrating the supply chain functions and marketing in an organization. In this way, the findings suggest that the demand planner key-job scopes can be extended by incorporating four different research topics and the two topics of recent blog posts.

B. Defining the Key-Job Scopes for Demand Planner Role

Demand planning is located between the marketing and supply chain functions. The required information flow, communicated from marketing-supply chain functions, provides the input-feedback information necessary to support the forecasting component in demand planning (Croxton, et al., 2002; Lapide, 2006; Melo and Alcantara, 2014; Vlckova and Patak, 2010; Swierczek, 2020; Jüttner, Christopher and Baker, 2007; Thomé et al., 2012). Some contemporary demand planning tools such like, Demantra, SAP with APO (Advance Planning and Optimization), and Relex have features for demand forecasting to be incorporated, with input-feedback of marketing promotional plan to produce the final demand forecast and channel for business execution (Oracle, n.d.; SAP, n.d.; Relex, n.d.). Thus, a demand planner necessarily uses any one or more than of these demand planning tool. Moreover, according to Swierczek, (2020), demand planning helps to mitigate the risks and disruptions in supply reinforcing the assertion of Thomé

et al. (2012) and Wijkstra (2020) that S&OP ensures that demand planning helps to prevent the risks and disruptions potentially created by demand management in the supply chain operations. Also, earlier, Vural (2015) had asserted that the mutual support of SCM and DCM is able make two entities become sustainable. In short, a good practice of demand planning tends to promote a successful demand planning strategy for an organization to survive (John Galt, n.d.).

Demand planner requires ability to able to sense opportunities and risks. This ability can be acquired through being alert to, and understanding, the internal and external factors of market conditions and shifting environmental changes. The alertness or awareness to these factors are important for better demand forecasting (Melo and Alcantara, 2014; Vlckova and Patk, 2010). For instance, Le Gia and Dang (2021) has illustrated the changing marketing concept in Vietnam from a traditional model to a new model to accommodate internal and external organizational influences that can improve the demand planning framework and redesign its supply chain in the FMCG industry. At the end of the day, understanding the dynamics of changing market, in alignment with the adaptive components in the supply chain functions, can generate a value-system configuration to meet customer needs and requirements (Jüttner, Christopher & Baker, 2007).

Demand forecasting as an integral part of demand planning is necessary to generate pertinent information for better demand management of market-consumer responses. As such, it is the main job scope of the demand planner to predict future demand and emerging trends, among others, in consumption-purchase behavior patterns and lifestyle preferences (Lapide, 2006; Vlckova and Patak, 2010; Demand Caster, 2019; webdevelopers@versacreative.com, 2021). In materials on this aspect of demand planning, some characteristic elements that can be constituted as part of the demand planner's job scopes are as follows:

1. Historical sales data (Vlckova and Patak, 2010; Swierczek, 2020; Kumar, 2016; DemandCaster, 2019; webdevelopers@versacreative.com, 2021; Demand Solution, 2020; admin, 2021)
2. Marketing promotional plan (Vlckova and Patak, 2010; Kumar, 2016; John Galt, n.d.; DemandCaster, 2019; Demand Solution, 2020)
3. Effects of marketing and advertising that able to influence the demand (admin, 2021; Demand Solution, 2020)

4. Demand pattern analysis and customer behavior study (John Galt, n.d.; Demand Solution, 2020)
5. Factors of constraint, limitation and challenge (Matopoulos, Ranitovic and Bourlakis, 2012; Merkurjeva, Valberga and Smirnov, 2019; DemandCaster, 2019; webdevelopers@versacreative.com, 2021; Demand Solution, 2020; admin, 2021).
6. Product shelf life (Matopoulos, Ranitovic and Bourlakis, 2012; Merkurjeva, Valberga and Smirnov, 2019)
7. Behavior of distributors and retailers (admin, 2021)
8. Weather condition (Demand Solution, 2020)
9. Some special events (Demand Solution, 2020)
10. Social political factors (admin, 2021)

Demand forecasting, as a future-prediction of conditions of uncertainty in an organization and its operational environment, are necessary to increase the forecast accuracy of target demand and supply (Vlckova & Patak, 2010; Merkurjeva, Valberga & Smirnov, 2019; Jüttner, Christopher & Baker, 2007; Ávila et al., 2019; Wijkstra, 2020; John Galt, n.d.; DemandCaster, 2019). Even though the historical sales data is good for analysis to understand the past demand trend and pattern and as a guidance to predict future pattern and trend, it may result in poor performance due to ineffective demand planning, inefficiency supply chain functions, over-demand projection from marketing, out-of-stock from suppliers and others. So, the impact from commercial transactions, sales records and marketing agenda to influence and stimulate future market demand are needed inputs into demand forecasting including new projection techniques of preparation and analysis. There is, however, a pitfall if demand planner follows exactly the sales forecast provided by sales teams in demand forecasting; for example, an over-demand forecasting will cause an over-stock or other unwanted results following the execution of the supply chain functions. Nevertheless, the historical sales data, used to manage the sales-team expectations based on demand-sales patterns of customer or distributor analysis, enable the demand planner to evaluate customer-purchase behavior or distributor-network behavior respectively.

Upon considering a host of influencing elements, there is still a need to align them with the strategic organization guidelines and practices (Melo & Alcantara, 2016; Al Qalhati et al., 2020; Croxton et al., 2002; Lapide, 2006; Melo and Alcantara, 2014; Vlckova and Patak, 2010; Kumar, 2016), and to construct the demand plan for the next alignment with supply chain functions (Lapide,

2006; Vlckova & Patak, 2010; Kumar, 2016; John Galt, n.d.; DemandCaster, 2019). Then the aligned demand-supply plan will be review again by all stakeholders for the final round to determine a consensus on the demand-supply plan to be executed; and this process should aid the S&OP (Lapide, 2006; Kumar, 2016; DemandCaster, 2019).

In summary, the incapacity of supply chain functions or networking such as third party logistics, third party suppliers or others must be included in demand forecasting to ensure the successful execution of the demand plan. In addition, a better understanding of the constraints, limitations and challenges arising therefrom can help generate a more precise future-demand prediction. The unexpected impact from the weather conditions such as flash flood, unforeseen event like the lockdown restrictions for COVID-19 pandemic control, and unanticipated political disruptions ensuing a new government takeover with social consequences, can also increase the failure rate of demand forecasting. All said and done, the fundamentals of product-shelf life are a basic to monitor slow moving and obsolete (SLOB) inventory. The demand planner therefore must download the systems SLOB report to reduce the demand forecast or stop the demand forecast to prevent further risks. Invariably, the execution to reduce the SLOB inventory requires the collaboration between commercial team and inventory team as part of supply planning functions.

C. Supply Planner Job Scopes

Kumar (2016) had described the features in the S&OP process of supply planning as follows:

1. Supply planning stage is after the demand planning stage in the process of S&OP.
2. In supply planning stage, the demand plan prepared by demand planning function will be reviewed by the production planner and purchase manager to ensure the availability of raw materials, the monitor of inter-organization capacity, vendor capacity, workforce capacity and other supply chain matters that are able to cope with the demand plan. If not, the plan of supply chain needs to be reworked.
3. The output from supply planning becomes the input for the next stage in order to balance demand and supply.

Supply planning therefore is an entity driven to accomplish the demand plan by considering inventory, production, logistics and manage the components such as the status of open and planned customer orders, on-hand stock quantity, safety stocks, lead times, batch sizes of the production, minimum order quantities (MOQ), and on-time order-delivery to meet the demand (Demand Solution, 2020). In short, demand planning comes before supply planning to fulfill demand-order need (webdevelopers@versacreative.com, 2021).

In the blog posts, a demand planner is defined as the role player in demand planning and supply planner as the role player in supply chain function (admin, 2021; Demand Caster, 2019). Supply planner is a role in supply chain function to understand the demand forecast and develop the way to meet planned demand, working closely with the functions of logistics, operations, production and finance (Demand Caster, 2019). The same key words, according to admin (2021) are used to describe supply planning related to inventory, production, logistics factors, planned and received orders, current inventory, the setting of MOQ, lead times in expectation setting, production leveling, safety stocks controlling, and chasing order to meet demand. In summary, the supply planner role in supply planning functions is synonymous with the descriptions of supply chain functions or SCM in most published articles. Thus, integrating demand into SCM can be understood as integrating marketing into supply planning. Thus, the demand planner and supply planner roles are distinctively defined from the synthesized analysis-outcome of the reviewed articles and blog posts. The supply planner is not the main subject of this study, but the supply-planner job scopes identified here will help to define the demand-planner job scopes significantly.

D. “Cross-functional” as Demand Planner Job Scope

Hays (n.d.) had stated that the demand planner role is cross-functional in nature for organizations in Malaysia, thus moving away from the traditional model of silo and to simplify its functions. The term ‘cross-functional’ is used synonymously with coordination, integration, communication and cooperation (Gemser and Leenders, 2011). It is also used or paired together with other suitable words, according to Leiby and Ha-Brookshire (2020), to highlight the joint-full meaning of the paired words. However, all the cross-functional terms in 7 articles are not related to the demand planner role (Melo and Alcantara, 2016; Javed et al., 2020; Croxton, et al., 2002; Lapide, 2006; Melo and Alcantara, 2014; Jüttner, Christopher and Baker, 2007; Kumar, 2016; Thomé et al.,

2012), but they closely related to the process of demand management, DCM and the process features of S&OP. The cross-functional term refers to the teams, not individuals (Leiby and Ha-Brookshire, 2020); and according to Robbins and Judge (2013) earlier, a cross-functional team is commonly used to mean the involvement of a group of people with different expertise to work together to accomplish a specific task or project. Therefore, cross-functional shall not apply to the demand planner job scope. But the demand planner role can be described as part of the cross-functional team to manage demand together with other functions. The preliminary condition is that the integrated marketing in the supply chain functions and demand planning becomes a process or component of the SCM.

E. The Cross-Functional Integration in S&OP

The cross-functional integration among marketing, demand planner and supply planner in an organization can be created through S&OP (Thomé et al., 2012) for demand and supply to be synchronized and balanced (Melo and Alcantara, 2016; Croxton, et al., 2002; Lapide, 2006; Melo and Alcantara, 2014; Smellie, 2012; Swierczek, 2020; Jüttner, Christopher and Baker, 2007; Shedlawski, 2017, p. 6; Kumar, 2016; Demand Caster, 2019). The new product phase in and phase out of existing product during the synchronization of demand and supply is important for the forecast to be updated (Croxton et al., 2002). The information flow for the new product phase in has to be provided by marketing and conveyed to the supply chain functions to determine the lead time, capacity, cost of inventory holding, warehousing storage and transportation with follow-up feedback to marketing (Jüttner, Christopher and Baker, 2007). So, after demand planner has received the details of the new product phase in from marketing to determine the demand forecast, they are relayed to the supply planning team to execute the order to manufacturing plant for production and fulfillment according to the aligned demand-supply plans of marketing, demand planner and supply planner.

S&OP provides the cross-functional process for all stakeholders to come together for collaborative decision making (Kumar, 2016), with the demand planner as the initiator in the S&OP (Demand Caster, 2019). The current global business environment, advocating the application of S&OP (Demand Solution, 2020), secures the advantage of a final decision from all stakeholders to ensure a proper planning be executed for better result-outcome achievement (webdevelopers@versacreative.com, 2021). Key performance indicator (KPI), a kind of past performance analysis measurement, enables the demand

planner to forecast with accuracy. Invariably, it is imperative for an organization to invest in a system that is able to generate different aspects of functional KPI reports for the demand planner to access and take lead to conclude a consensus on the demand-supply plan in S&OP. The consensual demand-supply plan is required to be recorded as official minutes of the meeting decisions, with the demand planner as the Chair of the S&OP monthly meeting (Kumar, 2016). In essence, the meeting-agenda reviews the last consensual demand-supply plan in the new month of S&OP in order to identify the failure factors so that each monthly repeated S&OP decision can improve the efficacy of functional performance gradually to ensure more accurate demand planning and demand forecasting.

In summary, throughout the demand managing process, the market or economy can be better managed by manipulating the demand to stabilize with supply (Smellie, 2012). But the demand planner must be able and quick to intervene when an exceptional or high demand occurs in order to avoid negative consequences such as running out of raw material, and insufficient supply chain capacities that can weaken all or incapacitate certain crucial functional performance to birth unintentional patterns of sporadic demand trends, resulting in unexpected disruptions within and outside the organization and its environment respectively.

F. Statements of Defined Key-Job Scopes for Demand Planner

1. To collect, analyze and verify the reliability of the data for historical sales to determine the past demand trends forecast proposal.
2. To collaborate with commercial teams (sales and marketing) to receive the input of promotional plan or sales forecast and any market intelligence that can influence future demand trends.
3. To challenge the input gathered from commercial teams if required, with analyzed data and fact.
4. To work closely with supply planner to gain up-to-date details of lead time, minimum order value or minimum order quantity, safety stock, current on-hand stock quantity or other relevant aspects for demand forecasting.
5. To have routine communication with supply planner to capture any up-to-date supply chain issues or disruption factors related to prices of commodities, raw materials, production capacity, shipping and logistics, third party logistics (3PL), distributors or other relevant issues.
6. To check forecast-accuracy with the input from commercial teams, up-to-date supply details and recent supply chain issues to form the final forecast.
7. To identify and update the forecast-accuracy for slowdown-demand inventory items in progressively obsolete report or ageing report.
8. To align the forecast for phase in of new product with commercial teams and supply planner while removing the forecast for existing phase out inventory items.
9. To ensure the processes of demand planning and demand forecasting comply with the company or organization policies, guidelines and standard operating procedures (SOP).
10. To propose a new demand plan to top management on spotted opportunities or risks that can affect favorably or otherwise respectively the demand planning of the company or organization business internally and externally at micro and macro perspectives.
11. To propose a new framework for demand planning when there is a change in market structure that can impact on the existing supply chain processes.
12. To manage, on a win-win basis, exceptional or high demand by liaising with commercial teams (sales and marketing) and supply planners in response to changing and evolving customer demand.
13. To perform the key performance indicator (KPI) analysis for the key organizational functions such as sales performance by business unit, backorder, on-time delivery in full quantity (OTIF), stock availability, forecast accuracy or other relevant KPI in order to assess the factors causing negative impact to the previous demand plan and also offer a proposed improvement plan.
14. To use a set of contemporary demand forecasting tools invested by the organization to aid the demand planning processes.
15. To chair the S&OP meeting, conclude a consensus forecast-demand plan in the documented minutes of the meeting (NB: This is only applicable to the organization implementing the S&OP process).

G. Data Responses of Interview Design and Analysis

In the interview question-design, 15 statements on the demand-planner job scopes constitute the basis for respondents to answer the question “Is this job scope practiced by the demand planner role only in your current company/organization?” with either a “Yes” or “No”

response that requires a comment to justify or explain the answer. The interview form was sent out to 277 interviewees from 22 countries connected with the researcher of this study via LinkedIn. A follow-up copy of the interview form was sent to their respective emails as a means to track responses both from LinkedIn and emails. A total of 69% of interview forms was sending out to interviewees currently working in various city locations in Malaysia. However, only 14 out of 20 interview-complete form respondents were from 4 cities of Malaysia (Johor 1, Kuala Lumpur 3, Penang 3 and Selangor 7). The remaining 6 respondents were from Bangladesh, Denmark, Pakistan, Saudi Arabia, Singapore and United Arab Emirates. 19 respondents have demand planning experience and only 1 respondent is non-demand planner.

The collected interview data for the question to all 15 stated job scopes is presented in Figure 1 below. Based on the feedback for “No” reply, all 20 respondents stated that 15 job scopes are practised by the demand planner in their

current organizations. The exceptions are (i) Statements 3, 13 and 14 that are not applicable to rental business in the construction industry; (ii) Statement 14 is not applicable to the organization not investing in demand planning tool; and (iii) Statement 15 is not applicable to the organization not implementing the S&OP process or meeting. Nevertheless, most stated job scopes were found not only belonging to the demand planner but also other roles in the organization, except for Statement 9 in which the processes of demand planning and demand forecasting need to follow the organization’s policy and guidelines by the demand planner only. Some overlapping of the demand-planner job scopes with supply planner and other supply chain functions are attested by Statements 1, 2, 3, 10, 11 and 12. For Statements 4 and 5, the organization without the supply-planning function, the demand planner role is mixed with that of the supply planner. In this way, supply planning also becomes the task for the demand planner in the organization.

Question - Is this job scope practiced by the demand planner role only in your current company/organization?		
No	Total Yes	Collective Feedbacks for "No" Reply
1	13	This job scope also belongs to finance, supply planner, marketing, sales team and other relevant departments.
2	16	This job scope also belongs to supply chain functions, R&D, product management, marketing and other relevant departments.
3	15	i. This job scope also belongs to sales team, supply chain functions, finance, CFO, CSCO (chief supply chain officer), CEO and operation teams. ii. This job scope not applicable to rental business.
4	13	i. This job scope also belongs to disposition planner, procurement, inventory planner and customer care team. ii. No supply planner role in the organization, so demand planner needs to act as supply planner. iii. Demand planning role is mixed with supply planning role in the organization. iv. Supply planning is also the role of a demand planner in the organization.
5	13	i. This job scope also belongs to disposition planner. ii. No supply planner role in the organization, so demand planner needs to act as supply planner. iii. Demand planning role is mixed with supply planning role in the organization. iv. Supply planning is also the task of demand planner in the organization. v. Planner, logistic, product marketing/engineer, etc will get to know the same information to achieve smooth process.
6	17	Coexist review with supply planning team in controlling better inventory.
7	19	
8	15	This job scope shall involve sales team. / This practice will initiate by demand planner but not only belongs to demand planner.
9	20	
10	15	This job scope also belongs to supply planner. / This job scope shall involve sales team.
11	15	This job scope should belong to all relevant stakeholders in the organization.
12	15	This job scope is overlaps with disposition planners. / This job scope is belonged to relevant teams work collaboratively.
13	10	i. This job scope also belongs to supply planner, sales team and supply chain functions. ii. Demand planner will measure forecast accuracy lag 3. iii. All departments have their own analysis and report to ensure the company running smoothly. iv. This job scope not applicable to rental business.
14	15	The organization is not using any software to generate demand forecast. / Tableau is mainly utilized for forecasting. / This job scope not applicable to rental business.
15	13	No S&OP process in the organization. / KPI is used for the discussion between stakeholders in the organization. / The organization is service provider thus just follow the customer demand.

Figure 1: Collected Interview Data for the Question on all 15-stated Job Scopes

Result of Profile Review for LinkedIn Subject Matter Experts

The interview response rate in this study is 7.22%. Even though the response rate is low, the interview method has successfully uncovered the mixture of demand planning role with supply planning role.

(a) Profile Review by LinkedIn 31-Country Results

Country	Non-Mixed DPR			Mixed DPR				Grand Total		
	DPR w DP jsd	DPR w less jsd	DPR w no jsd	DPR w mjsd	MR w mjsd	MR w less jsd	MR w no jsd		Not DPR but having mjsd of DP & SP	
Algeria	1	1	2						4	
Argentina					1		5		6	
Australia			1		1		6		8	
Bangladesh			2	1	3				6	
Canada					1		7		8	
Chile				1			6		7	
China				1	1		1		3	
Ivory Coast					1				1	
Denmark				1					1	
France		1		1	1		4		7	
South Africa				1					1	
Germany			3		1		3		7	
Greece			1			1			2	
Hong Kong, China							3		3	
India			6	2	2		2	1	13	
Indonesia	1				2		3		6	
Israel							1		1	
Italy				2	1		1		4	
Japan				1		1	2		4	
Kuwait				1	1				2	
Malaysia	6	4	51	28	18		36	16	159	
Morocco							3		3	
Pakistan			1	1			1	1	4	
Philippines			1					1	2	
Saudi Arabia	1				1				2	
Singapore			3		3	1	5	2	14	
South Korea				1	3		3		7	
Thailand			1	1	1				3	
UK	1		5	3	2	1	4		16	
United Arab Emirates			1		4				5	
USA			4	9	2			1	16	
Grand Total:	10	6	82	55	50	4	96	22	325	
Proportion (Person):	98			227						
Proportion (%):	30%			70%						

Figure 2: Profile Review for 325 Subject Matter Experts from 31 Countries in LinkedIn

DPR = Demand Planner Role, w=With, DP=Demand Planning, SP=Supply Planning, jsd=Job Scope Description, mjsd=Mixed Job Scope Description, MR=Mixed Role

Figure 2 above shows a total 325 profiles from 31 countries have demand-planning working experience in the LinkedIn reviewed. Out of the 325 reviewed profiles, there are 227 profiles comprising 70% of the respondents under the group of mixed demand planner role having demand-planning working experience mixed with supply planning experience as well. An apparent weakness of this review method can be attributed to most of the 49% Malaysian profiles from Malaysia, out of the total 325 profiles.

(b) Profile Review for 17-Country ABC Organization Employees

The ABC Organization is a consumer goods industry headquartered in France with operations in more than 100 countries. Of the 76 profiles reviewed, all were found to have demand planning role mixed with the roles of supply planning or procurement in these organization in 17 countries. Details of the job titles for the 76 profiles are included in Figure 3 below. The profile review through this method reveals a practice of mixed-other roles in demand planning role that originates from the multinational companies (MNCs) expanding their businesses to other countries in the form of foreign direct investments (FDIs).

No	Country	Category	Position (Profile Count)	Total
1	Argentina	MR w less jsd	D&SP (1)	1
		MR w mjsd	S&DP (1)	1
		MR w no jsd	D&SP (2) / D&SP Semi-Senior (1) / D&SP Ssr (1) / S&DP (1)	5
2	Australia	MR w mjsd	D&SP + SAP Key User (1) / D&SP (1)	2
		MR w no jsd	D&SP (4) / Junior S&DP (1)	5
3	Canada	MR w no jsd	D&SP (2) / DP & Procurement (1) / Demand Planning and Procurement Analyst (1) / S&DM (1) / S&DP (2)	7
4	Chile	DPR w mjsd	Senior DP (1)	1
		MR w no jsd	D&SP (1) / S&DP (1) / SDP (3) / S/DP (1)	6
5	China	DPR w mjsd	Senior DP (1)	1
		MR w mjsd	Supply Chain Executive Demand Planning (1)	1
		MR w no jsd	Senior D&SP (1)	1
6	France (HQ)	MR w mjsd	S&DP (1)	1
		MR w no jsd	D&SP (3) / S&DP (1)	4
7	Germany	MR w no jsd	D&SP (1) / DP and Portfolio Manager (1) / Senior D&SP (1)	3
8	Hong Kong	MR w no jsd	D&SP (2) / DSP (1)	3
9	Israel	MR w no jsd	Supply & Demand Planning Analyst (1)	1
10	Italy	DPR w mjsd	DP (2)	2
		MR w mjsd	D&SP (1)	1
		MR w no jsd	D&SP (1)	1
11	Japan	DPR w mjsd	Demand and Supply Planning Manager (1)	1
		MR w less jsd	Demand / Supply / POS Planner (1)	1
		MR w no jsd	DP & Procurement (1) / DSP (1)	2
12	Malaysia	DPR w mjsd	Assistant Demand Planning Manager (1)	1
		MR w no jsd	DSP (4) / Senior D&SP (1) / Senior DSP (1)	6
13	Morocco	MR w no jsd	DSP (1) / S&DP (2)	3
14	Singapore	MR w mjsd	Demand & Supply Planning (1) / DSP (1)	2
		MR w no jsd	Assistant Demand and Supply Manager (1) / D&SP (1) / DSP (1)	3
15	South Korea	DPR w mjsd	DP (1)	1
		MR w mjsd	D&SP (2) / Jr. D&SP (1)	3
		MR w no jsd	Jr. D&SP (1) / Senior D&SP (1) / Sr. D&SP (1)	3
16	UK	MR w no jsd	S&DP (1)	1
17	USA	DPR w mjsd	Demand Planning Manager (2)	2
Total:				76

Figure 3: Profile Review of 76 Work-Experience Employees in 17-Country ABC Organizations with Supply Planning-Procurement Mixed Roles

MR=Mixed Role, w=With, jsd=Job Scope Description, mjsd=Mixed Job Scope Description, DPR=Demand Planner Role, D&SP=Demand & Supply Planner, S&DP=Supply & Demand Planner, DP=Demand Planner, SDP=Supply Demand Planner, DSP=Demand Supply Planner, S/DP=Supply/Demand Planner, S&DM = Supply & Demand Management, HQ=Headquarter

(c) Profile Review for 3-Country XYZ Organization Leaders and Employees

XYZ Organization is a provider of delivery services for customers ordering groceries their online platform. This organization is headquartered in Indonesia and has operations in three countries of Indonesia, Malaysia and Thailand. 7 profiles perform the demand planning role in the 3-country located XYZ organization mixed with supply planning role (see Figure 5 below). All 7 employees of are under the leadership of a group head with current and past working experiences as shown in Figure 4 below.

This leader as the group head in XYZ organization is responsible for two functions of demand planning and supply planning. However, more than 15 years of past working experience by this leader are as non-demand planner. So, when this leader holds the position of a

manager in Organization D and F in 3 countries, and as supervisor in Organization E, with working experience as non-demand planner, he or she performs the job description of demand planning and supply planning. And as his or her career advances with XYZ organization,

this leader establishes a team of executive, analyst and manager with the mixed roles of demand and supply planning to assist. In essence, this profile review suggests that the practice of mixed other roles in demand planning role can be initiated by the leadership in the organization.

No	Position Level	Category	Organization	Working Experience Year	Country
1	Group Head	MR w no jsd	XYZ	7 Months (Present-May'22)	Malaysia
2	Manager	Not DPR but having mjsd of demand planning and supply planning	F	2 Years	Turkey
3	Supervisor	Not DPR but having mjsd of demand planning and supply planning	E	2 Years 7 Months	Turkey
4	Manager	Not DPR but having mjsd of demand planning and supply planning	D	1 Year 8 Months	Malaysia
5	Manager	Not DPR but having mjsd of demand planning and supply planning	D	7 Months	Turkey
6	Manager	Not DPR but having mjsd of demand planning and supply planning	D	3 years 3 Months	Turkey
7	Manager	Not DPR but having mjsd of demand planning and supply planning	D	6 Months	India
8	Analyst	Not DPR w jsd	D	2 Years 7 Months	Turkey
9	Team Leader	Not DPR w jsd	D	2 Years 1 Month	Turkey
10	Staff	Not DPR w no jsd	D	7 Months	Turkey

Figure 4: Past Working Experience of Leaders in XYZ Organization Leading 7 Employees

MR=Mixed Role, w=With, jsd=Job Scope Description, DPR=Demand Planner Role, mjsd=Mixed Job Scope Description

XYZ Organization				
No	Country	Category	Position Level	Profile Count
1	Indonesia (Headquarter)	Mixed role with no job scope description	Analyst	2
2	Malaysia	Demand planner role with mixed job scope description	Manager	1
			Executive	1
				Analyst
3	Thailand	Mixed role with mixed job scope description	Analyst	1
			Demand planner role with mixed job scope description	Manager
Total:				7

Figure 5: Profile Review for 3-Country 7 Employees with Demand-Planning Working Experience under Same Past-Experience Leadership of XYZ Organization

Conclusion

To make demand forecast as accurate as possible, the appropriate product history based on past-period data for forecasting future data on events and promotions or internal and external trends is adopted. A demand plan normally starts with a statistical forecast using historical data, layered into it with additional market intelligence on causal events, experimental methods, and judgmental factors bounded by a timeline of eight to eighteen months, with a lead time emphasis. Significantly, serious consideration is necessary of quantity, ability, willingness, prices, and period of time as key influencers of different types of demand including individual and market demand, organization and industry demand, autonomous and derived demand, demand for perishable and durable

goods or products, and short-term and long-term demand. Demand and supply planning and management must also consider consumer tastes, preferences and expectations, disposable income, changing prices of products or services, promotion and advertising expenditures, and fluctuating volume of product or service consumption. A common formula or tool for forecasting-precision in demand planning is the demand equation or function stated as follows: The quantity demanded (qD) is a function of five factors - price, buyer income, the price of related goods, consumer tastes, and any consumer expectations of future supply and price.

In conclusion, demand planners play a crucial role in the supply chain of an organization or a company. They use the analytical, marketing, and sales data of a company to

effectively estimate future product demands premised on planning inventory flow, statistical data analysis, and generating forecasting solutions. Hence, to achieve this goal, demand planning is strategically aligned with demand management to formulate and execute respectively an action plan that combines sales forecasting, supply chain management and inventory management with teamwork-driven orientation and commitment. Organizational key job scopes in demand planning therefore include upstream and downstream management and analysis as well to highlight the demand planner role at the start of the planning process and as the cornerstone of logistics optimization to clarify the confusion, overlap and conflict of within and arising from the supply chain stream of dynamic changing circumstances in its internal and external industry-based operations that extends beyond the organizational milieu into community or societal precincts, country and regional contexts, and the global environment.

In short, the global context of internationalization that accounts for huge demand volatility, increase in shorter product lifecycle, new distribution channels linked to e-commerce, intensified competition, among others, increasingly highlight the need for applications of precision forecasts-accuracy process and strategic-timely flow management tools such as that ITC-driven solutions, Block Chain and Big Data marketing intelligence, and even the artificial intelligence (AI) of present-day robotics. Thus, the characteristic features of conventional key job scopes are not only change-prone but technology-sensitive and value-transforming beyond the limited scope of this study.

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APPENDICES

Appendix 1 The summary for 29 materials and the theme extracted from each summarized material.

Material Type: Primary Article	
Topic: Demand Management	
Author & Summary	Theme
<p><u>Melo & Alcantara (2016)</u> The critical success factors were identified to improve demand management performance in supply chain: 1. The integration and coordination for processes management between demand activities and supply chain are essential to maximize shareholder value. 2. Few practices are related to demand management such as demand forecasting, S&OP, CPFR and demand segmentation. 3. The process of demand management create collaboration between supply chain operations and marketing management to develop the synchronization with the strategies of the organization, the capacity of the production and the needs of final customers.</p>	Demand management / Follow the organization guidelines, strategic and practices / Integrating demand and supply chain management / Demand forecasting / Synchronizing demand and supply / Cross-functional / Sales & operations planning (S&OP)
<p><u>Croxton et al. (2002)</u> Demand management process can be constituted in supply chain management by the strategic and the sub processes of operational that focus on sales forecast identify with the plan information flow to increase the flexibility and reducing the variability to produce the balancing, matching and synchronizing the customer's demand with supply chain capabilities by incorporating the company strategy to meet customer needs.</p>	Demand management / Integrating demand and supply chain management / An element or process in supply chain management / Follow the organization guidelines, strategic and practices / Information system to support demand planning process / Demand forecasting / Synchronizing demand and supply / Cross-functional
<p><u>Lapide (2006)</u> 1. The integration of demand management in supply chain management is well recognized as a strong weapon in an arsenal of an organization to obtain the competitive advantage for shaping and creating customer demand such as what perform by Dell on daily basis. 2. The process of S&OP practiced by the majority of the larger manufacturing companies is kind of medium term of demand management process to balance the current and future supply and demand. 3. The demand management integrated with S&OP able to provide the cross-functional ability to develop the supply and demand plans based on consensus oriented to ensure the corporate goals can be met when demand plans can be well executed by merchandizing, sales, marketing and customer service.</p>	Demand management / Follow the organization guidelines, strategic and practices / Information system to support demand planning process / Integrating demand and supply chain management / Demand forecasting / Future demand / Demand plan / Synchronizing demand and supply / Cross-functional / Sales & operations planning (S&OP) / Consensus oriented in S&OP process
<p><u>Ali et al. (2018)</u> The improvement of demand management performance was proven when integrated with S&OP</p>	Sales & operations planning (S&OP) / Demand management
Topic: Demand Planning	
<p><u>Gavialis et al. (2013)</u></p>	Demand management / Demand planning / Demand forecasting

<p>The creation of a coordinated flows of demand through demand management is managed by various processes such like demand planning and sales forecasting</p>	
<p><u>Vlckova & Patak (2010)</u> Role of demand planning can be summarized as following: 1. A set of methodologies were combined with information technologies in demand planning to utilize the demand forecast in the process of planning. 2. Some partial methods of planning are developed to optimize the organization processes to provide able the real sales data for a particular product of a particular customer in a short time such as Manufacturing Resource Planning II (MRP II), S&OP or Advanced Planning and Scheduling (APS). 3. Demand planning not only as one of many tools to manage the organization processes, but as the principle for organization to perform planning and producing the effective forecast for making the decision at the level of strategic, tactic and operative. 4. The thinking and understand the market together with internal and external factors are required in continuous forecasting process to plan and predict future demand for potential future development. 5. The integration of the impact from promotional events into the forecast and demand plan are essential to improve the accuracy level of both not only for triggering the next planning activities to production, procurement and distribution (supply chain management functions in organization) but also important to the strategic planning of marketing, finance, investment designs, human resources and R&D (research and development).</p>	<p>Demand planning / Information system to support demand planning process / Demand forecasting / Historical sales data / Sales & operations planning (S&OP) / Follow the organization guidelines, strategic and practices / Market understanding / Awareness on internal and external factors / Future demand / Integrating demand and supply chain management / Marketing promotional plan / Forecast accuracy / Demand plan</p>
<p><u>Le Gia & Dang (2021)</u> The impact from new 4Cs marketing concept (customer, cost, convenience and communication) replaced the traditional 4Ps model (price, product, promotion, place) in Vietnam had influenced organizations to think out the methods of supply chain redesigning and improving the demand planning framework for FMCG industry.</p>	<p>Demand planning / Market understanding / Awareness on internal and external factors</p>
<p><u>Venkatadri, Wang & Srinivasan (2021)</u> Demand planning not only bring the benefit to the internal supply chains but also able to help and improve suppliers' performance by achieving service level from the process to respond the RFQ (request for quotation) then to accept the order firmly and subsequently plan until to demand fulfilment.</p>	<p>Demand planning</p>
<p><u>Matopoulos, Ranitovic & Bourlakis (2012)</u> The challenge and constraint of product shelf life were spotted in the food processing industry to improve demand planning process.</p>	<p>Demand planning / Constraint, limitation and challenge / Product shelf life</p>
<p><u>Merkurveva, Valberga & Smirnov (2019)</u> The product shelf life can limit the accuracy of demand forecasting, thus demand forecasting also dependant to the product shelf life especially for those pharmaceutical products.</p>	<p>Demand planning / Product shelf life / Constraint, limitation and challenge / Forecast accuracy / Demand forecasting</p>
<p><u>Swierczek (2020)</u> Demand planning process not only consist of four main practices: demand forecasting, communication of predicted demand to synchronize supply with demand, data gathering and determination of goal but also as a higher-order construct for the mitigation of the disruption in Europe supply chains driven by operational risks.</p>	<p>Demand planning / Demand forecasting / Information system to support demand planning process / Synchronizing demand and supply / Historical sales data / The higher-order construct</p>

	of demand planning in supply chain / Mitigate risks and disruption in supply chain
Topic: Demand Chain Management	
<u>Jüttner, Christopher & Baker (2007)</u> The conceptual foundation for demand chain management was proposed involved of: 1. The integrating of demand with supply started from the contribution of customer buying cycle to increase the forecasting accuracy in demand process then triggering the responses of supply chain in supply process 2. Managing the integrated demand with supply processes through information technology, so called as digital integration 3. Configuring the value system by understand the market through marketing function in organization and configure with the supply chain functions in order to meet customer requirements and needs 4. To manage the working relationship between supply chain functions and marketing through cross-functional	Demand chain management / Forecast accuracy / Demand planning / Information system to support demand planning process / Integrating demand and supply chain management / Market understanding / Synchronizing demand and supply / Cross-functional
<u>Madhani (2016)</u> The demand chain management is kind of transformation of supply chain itself into demand-driven chain or simplify as demand chain to enhance the competitiveness with the reason as below: 1. Supply chain management focuses on demand fulfilment by establish efficient supply with cost-orientated in the processes of production and logistics, marketing emphasizes on create the demand for more revenue generating by fulfilling customer satisfactions after customer needs are determined. 2. Thus, the different natural of the functions of supply chain and marketing can resulting to some undesired things to happen such like: under or over delivery and losing the share of customer opportunities if there is no proper management in between. 3. Even supply chain processes can be established with the high efficiencies but supply chain alone only able to provide half of the solution, therefore demand chain management is significant as role player to complete the solution by providing the strategic approach through the integration of marketing factors into efficient supply chain processes and last response to market.	Demand chain management / Demand-driven chain / Integrating demand and supply chain management / Marketing emphasizes on create the demand
<u>Vural (2015)</u> Supply chain management able be sustainable in the whole value chain through the alternative perspective of the sustainable demand chain management, the better integrated of supply operations with market demand in the sustainable way can increase the demand chain management effectiveness.	Sustainability of supply chain management / Integrating demand and supply chain management / Sustainable demand chain management / Demand chain management
<u>Anning, Okvere & Annan (2013)</u> S&OP as a management tool can resulting to minimum inventory and on time in full quantity in the delivery, therefore achieve able customer satisfaction to the highest level and create more value adding to shareholders by having demand chain management in the situation be integrated with supply chain management.	Sales & operations planning (S&OP) / Integrating demand and supply chain management / Demand chain management
Topic: S&OP	

<p><u>Shedlawski (2017, p. 6)</u> The definition given by the American Production and Inventory Control (APICS) for S&OP is: A process to develop tactical plans that provide management the ability to strategically direct its businesses to achieve competitive advantage on a continuous basis by integrating customer-focused marketing plans for new and existing products with the management of the supply chain. The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing, and financial) into one integrated set a plan.</p>	Sales & operations planning (S&OP) / Integrating demand and supply chain management / Synchronizing demand and supply
<p><u>Kumar (2016)</u> 1. Demand, supply, volume and mix are the four fundamental parameters in S&OP. 2. The S&OP process consisting five stages: i. Historical data generation and collection ii. Demand planning process– To produce demand plan based on the checking or comparison processes for sales data, forecast and promotion plan from sales and marketing iii. Supply planning process – To review the demand plan prepared by demand planning and ensure the demand plan is achieve able with organization resources of raw material, workforce, capacity and other related matters in supply chain functions. iv. The processes of synchronizing or balancing the demand planning and supply planning through the cross-functional teams with the outcome of action plans or adjustment need to be conducted toward sales and marketing plan, raw material procurement and purchasing plan or production plan. v. The outcome from stage four to be discussed and decided through the execution of S&OP meeting to achieve the consensus forecast by aligning with the organization strategic planning, policies and financial goal.</p>	Sales & operations planning (S&OP) / Historical sales data / Demand planning / Demand plan / Demand forecasting / Marketing promotional plan / Supply planning / Synchronizing demand and supply / Cross-functional / Consensus oriented in S&OP process / Follow the organization guidelines, strategic and practices
<p><u>Ávila et al. (2019)</u> The newly design for the process of S&OP was implemented in a Portuguese wine producer and distributor showed the preliminary positive result in the forecast accuracy improvement, reduction of inventory, significant cost saving in production process and the information flow was found increased visibility and improved quality in the communication to support swift and effective decision making among stakeholders.</p>	Sales & operations planning (S&OP) / Forecast accuracy
<p><u>Wijkstra (2020)</u> The S&OP process was found able to identify, assess, mitigate and monitor the potential risks can be created from the demand management side, for example the consequence of inaccurate forecast causing to high inventory level and other bad impacts to the organization.</p>	Sales & operations planning (S&OP) / Mitigate risks and disruption in supply chain / Demand management / Forecast accuracy
Material Type: Secondary Article	
Topic: Demand Management	
<p><u>Melo & Alcantara (2014)</u> Demand management is defined with the following point: 1. Demand management was identified to has 2 frameworks: i. Marketing be integrated with supply chain management ii. An element or process in supply chain management</p>	Demand management / Integrating demand and supply chain management / An element or process in supply chain management / Awareness on internal and external factors / Market understanding / Follow the organization

<p>2. The requirement to carry out demand management process:</p> <ol style="list-style-type: none"> i. Awareness of internal and external factors in market understanding ii. The guidelines, strategic and the practices of operational in the organization iii. Sales forecasting from a well-designed and efficient of operational system to integrate supply and demand iv. Collaborative supply chain to meet customer's needs and achieve competitive advantage <p>3. The different initiatives such as collaborative planning, forecasting and replenishment (CPFR) and S&OP can be incorporated with demand management to develop the cross-functional integration to monitor sales forecasting be ensured align with the business plan execution.</p> <p>4. The successful for the process of demand management to be implemented is requiring the support from the organization's top management.</p>	<p>guidelines, strategic and practices / Information system to support demand planning process / Demand forecasting / Synchronizing demand and supply / Cross-functional / Sales & operations planning (S&OP)</p>
<p><u>Smellie (2012)</u> Demand management is kind of management to manage the market or economy by manipulating the demand with the intention to stabilize the relationship with supply.</p>	<p>Integrating demand and supply chain management / Demand management / Synchronizing demand and supply</p>
<p><u>Gligor (2014)</u> The implementation of demand management with S&OP by some manufacturing and marketing organizations able to achieve supply chain agility</p>	<p>Sales & operations planning (S&OP) / Demand management</p>
<p>Topic: Demand Chain Management</p>	
<p><u>Bumblauskas, Bumblauskas & Sapkota (2017)</u> The suggestion for supply chain organizations to be required more demand-based by work closer with customers (or end users) and suppliers to fulfil customers' needs through strategically in processes and tactically in operations.</p>	<p>Demand chain management / Demand-driven chain</p>
<p>Topic: S&OP</p>	
<p><u>Thomé et al. (2012)</u> The S&OP process able to play the role to improve organization performance with the following evidence finding:</p> <ol style="list-style-type: none"> 1. The negative effect of misaligned organization structure can be mitigated by the planning processes through cross-functional cooperation 2. The formal and informal communication able be improved between the functions, the networking and the internal integrating role 3. The positive outcome from the internal alignment to help the integrating of supply chain with suppliers and customers after the supply chain integration received the beneficial from inter-organizational information system. 	<p>Sales & operations planning (S&OP) / Mitigate risks and disruption in supply chain / Cross-functional / Information system to support demand planning process,</p>
<p>Material Type: Grey Literature of Blog Post</p>	
<p>Topic: Demand Planner Role in Demand Planning Function</p>	
<p><u>John Galt (n.d.)</u> Demand planning is the process to anticipate the demand to ensure the demand able to be met efficiently to customers' expectation by the organization's supply chain without causing excess expenses, and the role player for demand planning process in an organization is demand planner as bridge between sales and supply chain operations</p>	<p>Demand planning / Demand forecasting / Demand planner role in demand planning function / Integrating demand and supply chain management / Demand plan / Forecast accuracy / Analysis</p>

<p>to produce the demand plan that will determine the organization's inventory level, thus is it important the accurate forecast from demand planner through the analysis of demand pattern, study of customer behaviour and align with the sales and marketing plan especially the plan of promotional campaigns to keep demand planning strategy be successful for the survival of organization.</p>	<p>demand pattern and study customer behaviour / Marketing promotional plan / Sustainability of supply chain management / Sustainable demand chain management</p>
<p>Topic: Demand Planning versus Supply Planning</p>	
<p><u>DemandCaster (2019)</u> Demand planner as the role player in demand planning process and also as the initiator in S&OP process to produce demand plan by anticipating the future demand and forecast accurately through the close working with sales and marketing to gain awareness of new product, marketing promotions and initiatives together with the demand planner self-analysis of historical sales data and perspective of constraint to demand forecasting then balancing the demand plan with supply plan through the integration with supply planning functions in order to provide the synchronized plan of demand and supply to the final process of S&OP to achieve consensus of demand-supply plan to form firm business plan among all stakeholders (demand planner, supply planner, sales, marketing, finance, logistics, operation, and manufacturing team) then execution to meet customers' demand and expectation.</p>	<p>Demand planning / Demand planner role in demand planning function / Supply planner role in supply planning function / Supply planning / Demand plan / Demand forecasting / Future demand / Forecast accuracy / Integrating demand and supply chain management / Marketing promotional plan / Historical sales data / Constraint, limitation and challenge / Synchronizing demand and supply / Consensus oriented in S&OP process / Sales & operations planning (S&OP)</p>
<p><u>webdevelopers@versacreative.com (2021)</u> Role of demand planner in demand planning function to analyse and predict the future demand through two ways of forecasting consisted of unconstrained (to determine the total demand of a particular product in market) and constrained (limitation of finance cash flow, organization's supply chain capacity and capabilities) together with the historical sales data then involving into the S&OP final process to ensure the proper planning able to be taken for the achievement of demand and supply forecasting.</p>	<p>Demand planning / Demand planner role in demand planning function / Supply planning / Demand forecasting / Future demand / Historical sales data / Constraint, limitation and challenge / Sales & operations planning (S&OP)</p>
<p><u>Demand Solution (2020)</u> The implementation of an effective S&OP is must to the current environment of global business to maintain the competitive edge through the integrated demand planning with supply planning, thus the demand planner role in demand planning is crucial to forecast customer demand by aggregating the data from historical sales data, demand patterns and trends, the input from advertising and social media as market influences, promotional campaigns, weather and special events, furthermore two types of demand forecasting can be adopted by demand planner: unconstrained (raw potential demand without any factoring) and constraints (limitation of business function of operation) to facilitate customer orders and produce value in whole value chain (meet customers' expectation, minimize supply cost, inventory reduction that able meet desired-able serve level and cost saving by overall).</p>	<p>Sales & operations planning (S&OP) / Demand planner role in demand planning function / Demand planning / Supply planning / Demand forecasting / Historical sales data / Analysis demand pattern and study customer behaviour / Marketing promotional plan / Effect from marketing and advertising / Weather condition / Special events / Constraint, limitation and challenge</p>
<p><u>admin (2021)</u> The integrating of demand planning with supply planning provide the solution ease the collaboration between demand planner and supply planner effectively and help the business by utilizing the data and input from both functions of demand planning and supply planning to form single business plan, demand planner in the demand planning function need to consider different source of data when come to the two ways forecasting (unconstrained</p>	<p>Demand planning / Supply planning / Demand planner role in demand planning function / Supply planner role in supply planning function / Demand forecasting / Constraint, limitation and challenge / Historical sales data / Effect from marketing and</p>

and constrained) like past sales data, the effect from marketing and advertising, the distributors behaviour and the action from retailers and the factor of social political.

advertising / Behaviour of distributors and retailers
/ Social political factor

Appendix 2 The synthesis matrix for 36 collected themes from 29 materials.

Theme	Demand Management		Demand Planning	Demand Chain Management		S&OP		Demand Planner Role in Demand Planning Function and Demand Planning versus Supply Planning
	Primary Article	Secondary Article	Primary Article	Primary Article	Secondary Article	Primary Article	Secondary Article	Grey Literature Article
Integrating demand and supply chain management	(Melo & Alcántara, 2016), (Croxtón et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014), (Smellie, 2012)	(Vlckova & Patak, 2010)	(Jüttner, Christopher & Baker, 2007), (Madhani, 2016), (Vural, 2015), (Anning, Okyere & Annan, 2013)			(Shedlowski, 2017, p. 6)	(John Galt, n.d.), (DemandCaster, 2019)
Marketing emphasizes on create the demand				(Madhani, 2016)				
An element or process in supply chain management	(Croxtón et al., 2002)	(Melo & Alcántara, 2014)						
Demand management	(Melo & Alcántara, 2016), (Croxtón et al., 2002), (Lapide, 2006), (Ali, et al., 2018)	(Melo & Alcántara, 2014), (Smellie, 2012), (Gligor, 2014)	(Gayialis, et al., 2013)				(Wijkstra, 2020)	

Demand planning			(Gayialis, et al., 2013), (Vlckova & Patak, 2010), (Le Gia & Dang, 2021), (Venkatadri, Wang & Srinivasan, 2021), (Matopulos, Ranitovic & Bourlakis, 2012), (Merkuryeva, Valberga & Smirnov, 2019), (Swierczek, 2020)	(Jüttner, Christopher & Baker, 2007)		(Kumar, 2016)		(John Galt, n.d.), (DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution, 2020), (admin, 2021)
Demand chain management				(Jüttner, Christopher & Baker, 2007), (Madhani, 2016), (Vural, 2015), (Anning, Okyere & Annan, 2013)	(Bumblauskas, Bumblauskas & Sapkota, 2017)			
Demand-driven chain				(Madhani, 2016)	(Bumblauskas, Bumblauskas & Sapkota, 2017)			

Information system to support demand planning process	(Croxtton et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014)	(Vlckova & Patak, 2010), (Swierczek, 2020)	(Jüttner, Christopher & Baker, 2007)			(Thomé et al., 2012)	
The higher-order construct of demand planning in supply chain			(Swierczek, 2020)					
Mitigate risks and disruption in supply chain			(Swierczek, 2020)			(Wijkstra, 2020)	(Thomé et al., 2012)	
Sustainable demand chain management				(Vural, 2015)				(John Galt, n.d.)
Sustainability of supply chain management				(Vural, 2015)				(John Galt, n.d.)
Demand planner role in demand planning function								(John Galt, n.d.), (DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution, 2020), (admin, 2021)
Demand forecasting	(Melo & Alcántara, 2016), (Croxtton et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014)	(Gayialis, et al., 2013), (Vlckova & Patak, 2010), (Merkuryeva, Valberg			(Kumar, 2016)		(John Galt, n.d.), (DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution,

			a & Smirnov, 2019), (Swierczek, 2020)					2020), (admin, 2021)
Awareness on internal and external factors		(Melo & Alcantara, 2014)	(Vlckova & Patak, 2010), (Le Gia & Dang, 2021)					
Market understanding		(Melo & Alcantara, 2014)	(Vlckova & Patak, 2010), (Le Gia & Dang, 2021)	(Jüttner, Christopher & Baker, 2007)				
Historical sales data			(Vlckova & Patak, 2010), (Swierczek, 2020)			(Kumar, 2016)		(DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution, 2020), (admin, 2021)
Marketing promotional plan			(Vlckova & Patak, 2010)			(Kumar, 2016)		(John Galt, n.d.), (DemandCaster, 2019), (Demand Solution, 2020)
Effect from marketing and advertising								(admin, 2021), (Demand Solution, 2020)
Analysis demand pattern and study customer behaviour								(John Galt, n.d.), (Demand Solution, 2020)
Future demand	(Lapide, 2006)		(Vlckova & Patak, 2010)					(DemandCaster, 2019), (webdevelopers@versacreative.com, 2021)

Constraint, limitation and challenge			(Matopoulos, Ranitovic & Bourlakis, 2012), (Merkuryeva, Valberga & Smirnov, 2019)					(DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution, 2020), (admin, 2021)
Product shelf life			(Matopoulos, Ranitovic & Bourlakis, 2012), (Merkuryeva, Valberga & Smirnov, 2019)					
Behaviour of distributors and retailers								(admin, 2021)
Weather condition								(Demand Solution, 2020)
Special events								(Demand Solution, 2020)
Social political factor								(admin, 2021)
Forecast accuracy			(Vlckova & Patak, 2010), (Merkuryeva, Valberga & Smirnov, 2019)	(Jüttner, Christopher & Baker, 2007)		(Ávila, et al., 2019), (Wijkstra, 2020)		(John Galt, n.d.), (DemandCaster, 2019)
Demand plan	(Lapide, 2006)		(Vlckova & Patak, 2010)			(Kumar, 2016)		(John Galt, n.d.), (DemandCaster, 2019)

Follow the organization guidelines, strategic and practices	(Melo & Alcántara, 2016), (Croxtón et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014)	(Vlcková & Patak, 2010)			(Kumar, 2016)		
Supply planning						(Kumar, 2016)		(DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand Solution, 2020), (admin, 2021)
Supply planner role in supply planning function								(admin, 2021), (DemandCaster, 2019)
Cross-functional	(Melo & Alcántara, 2016), (Croxtón et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014)		(Jüttner, Christopher & Baker, 2007)		(Kumar, 2016)	(Thomé et al., 2012)	
Synchronizing demand and supply	(Melo & Alcántara, 2016), (Croxtón et al., 2002), (Lapide, 2006)	(Melo & Alcántara, 2014), (Smellie, 2012)	(Swierczek, 2020)	(Jüttner, Christopher & Baker, 2007)		(Shedlowski, 2017, p. 6), (Kumar, 2016)		(DemandCaster, 2019)
Sales & operations planning (S&OP)	(Melo & Alcántara, 2016), (Lapide, 2006),	(Melo & Alcántara, 2014), (Gligor, 2014)	(Vlcková & Patak, 2010)	(Anning, Okyere & Annan, 2013)		(Shedlowski, 2017, p. 6), (Kumar, 2016), (Ávila,	(Thomé et al., 2012)	(DemandCaster, 2019), (webdevelopers@versacreative.com, 2021), (Demand

	(Ali, et al., 2018)					et al., 2019), (Wijkstra, 2020)		Solution, 2020)
Consensus oriented in S&OP process	(Lapide, 2006)					(Kumar, 2016)		(DemandCaster, 2019)