SUPPLY CHAIN MANAGEMENT TALENTS SHORTAGE – A DEMAND-SUPPLY ANALYSIS

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ABSTRACT

This research analyzes the shortage in supply chain management talents. By sampling and performing SCM related job data analysis, we characterize the industry need. At the same time, we study the course syllabi in both Operations Management and SCM at undergraduate and graduate levels to understand the general supply of SCM talents. We further compare the demand with the supply and identify under-supply subjects, over-supply subjects, and mis-supply subjects and make recommendations to all interested parties on how to make adjustment and reduce the demand-supply mismatch.

Keywords supply chain management, demand and supply analysis

Introduction

The demand for SCM talents has increased drastically. The *26th Annual Salary Survey* from *Logistics Management* magazine reports salary increase across the board in the areas of SCM with an average of 4.8% increases in 2009. Along with the fast development in supply chain management, organizations find it more and more difficult to fulfill their positions related to SCM due to shortage of the qualified professionals with the required skills. There exists significant gap between the demand and supply of supply chain management talents which results in unfilled jobs and available candidates not meeting the skill expectations of the recruiters. MIT Center of Transportation and Logistics published a white paper titled "Are you prepared for the supply chain talent crises?" ([2]), which discusses the scenario of burgeoning growth in supply chain management jobs influenced by globalization and emergence of supply chain management as a strategic differentiator and value creator for the organizations. At the same time, there are not enough qualified people with the education and skills to take those jobs. Supply chain brain in its article titled "The hunt for talent, the supply chain on its own" ([1]) mentioned that the fact that finding and nurturing the right talent was among the five most critical issues cited by the 42 corporate members of the advisory board to the University of Tennessee's Global Supply Chain Institute. There are many contributing factors to this shortage including the influences from industry, universities, professional organizations (CSCMP, APICS etc.), and the potential candidates. Other factors like textbook industry and social media industry may also contribute to the mismatch between demand and supply.

On the supply side, educational institutions try to quickly adapt to the fast changing pace of this profession. In the recent SCM research development, Gunasekaran et al. ([3]) mentioned that there are five basic functional activities in supply chains, including procurement, inbound logistics, operations, marketing and sales, and outbound logistics. Rossetti and Dooley ([6]) identified three bundles of functions as sourcing, operations and logistics. Different researchers may propose different basic functions, but in general, these functions consist of topics like purchasing and supplier relationship management, transportation and logistics, sales and distribution, storage and inventory management etc. The second view is the process view of supply chains ([5]). Based on the research in this field, higher

education institutions have constantly adjusted their undergraduate/graduate programs and courses in order to address the need from industry. Johnson and Pike ([4]) focused on graduate level supply chain management education and showed the development of SCM education during late 90's. Rutner and Fawcett ([7]) mentioned that due to the fast changing of logistics and supply chain jobs, "universities across the country are redesigning their business curricula to include supply chain management". On the other hand, there are challenges for these changes of curricula, particularly, the disagreement on the common curricular of SCM among industries, academia, and professional associations ([8]).

DEMAND SUPPLY ANALYSIS OF SCM JOBS

Demand analysis of the SCM jobs

For the analysis of the demand of the SCM jobs, sample size of 6000 open jobs related to supply chain management has been considered. Based on the relevant categorization, a detail analysis has been done for 600 jobs, by taking 10% of the jobs from each category. The sample represents the jobs in multiple sectors and numerous organizations differing in the nature, size, products and global footprint. The jobs are categorized in different supply chain process areas of SCOR model named as 'Plan', 'Source', 'Make', 'Deliver'; along with a separate area of cross processes and a separate areas each of 'consulting and IT (information technology) integration' and 'third party logistics provider'.

Jobs categorization: Exhibit 1 represents the roles available in the areas of supply chain management with the organizations in different functional areas as well as with the support organizations operating as consulting and third party logistics business providers. Exhibit 2 represents the percentage distribution of industry wise division of the open jobs related to supply chain management. Integration of technology with the supply chain management operations and dependent requirement of skilled person is reflected in the analysis, as jobs categorized as 'IT services and technology consulting' have the maximum number of open roles marked under one category. Manufacturing and logistics are other sectors with high number of available jobs for the persons with right skill sets in supply chain management. The analysis clearly indicates that the jobs with the required skills in supply chain management are available across the sectors comprising of manufacturing, high-tech, logistics, retail, food & beverages, healthcare and Oil & Gas industry.

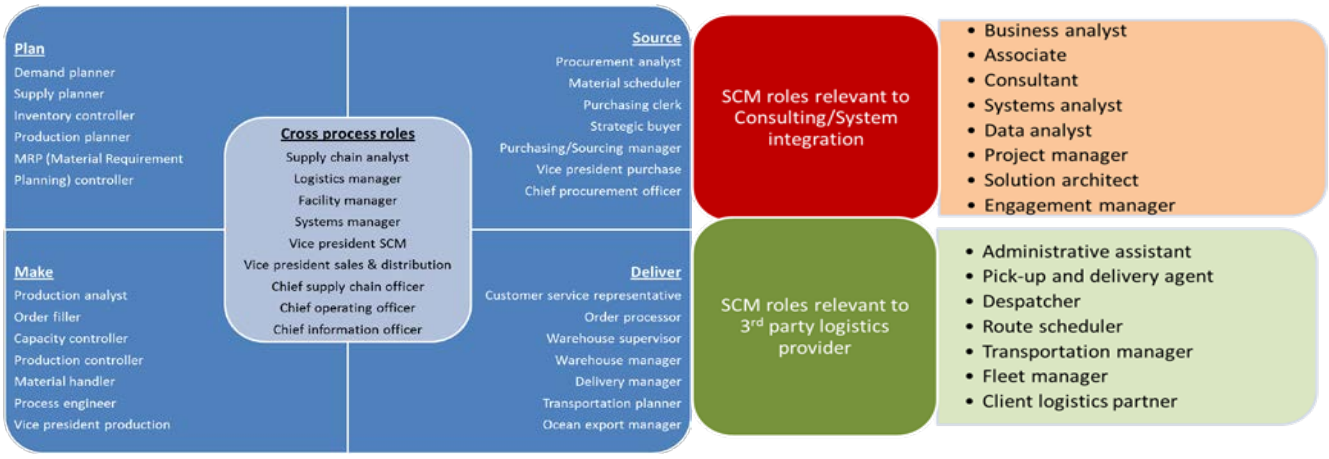


Exhibit 1: Roles in SCM (Supply Chain management) and related functional area

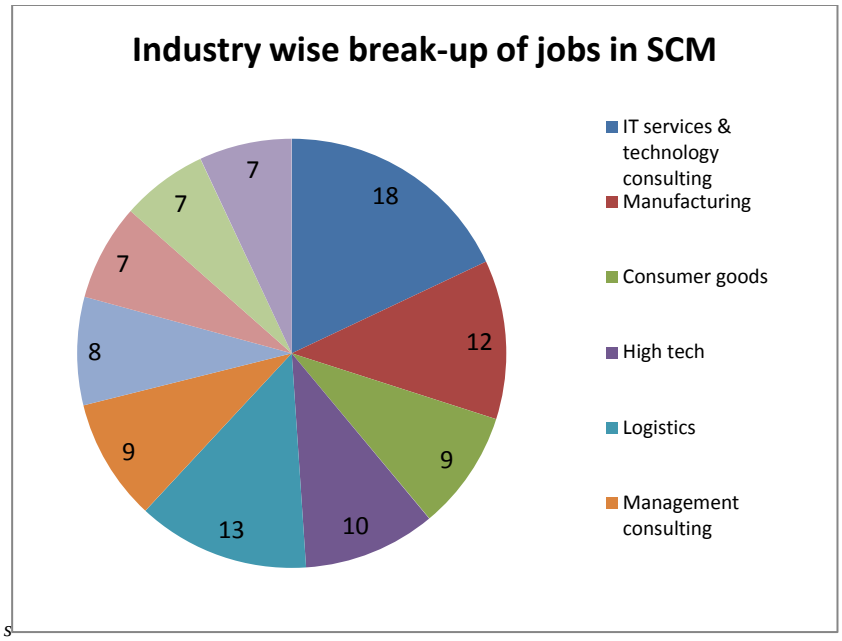
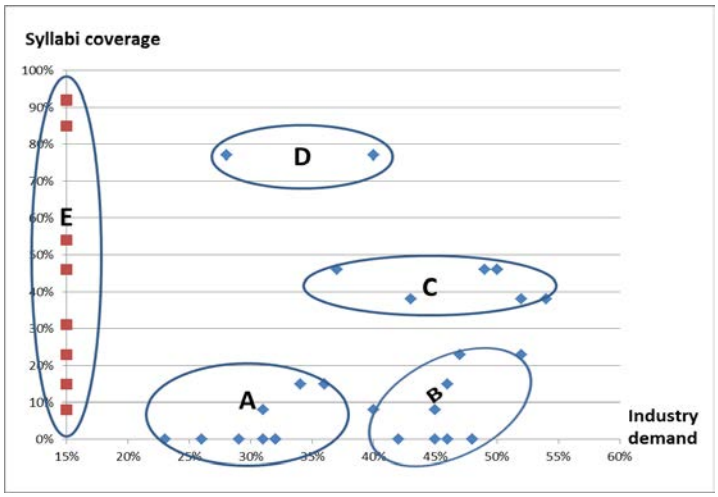


Exhibit 2: Industry wise break-up of sample of open jobs related to supply chain management

Supply analysis on SCM related course syllabi

The jobs in the area of SCM is getting filled by the professionals working in the same field of supply chain management, or, by the professionals working with industries in other areas; or, by the students who have recently completed graduate or, under-graduate courses related to supply chain and/or operations management. In our analysis, we have found that, due to lack of the SCM skills added during the education period, there is a shortage of professionals able to take jobs in SCM, and the organizations have to make a high investment to develop the internal talent for the positions related to supply chain management. Hence, for our research, we have focused on the courses offered in operations management and supply chain management at both graduate and undergraduate levels in the institutions in the United States. For our analysis, we have taken the syllabus of over 50 different institutions operating in different geographies in the United States. The syllabi studied are first grouped into two categories, Operations Management courses and Supply Chain Management courses. Under each category, we further divided the syllabi into two groups, undergraduate courses and graduate/MBA courses. The rational on studying OM and SCM courses separately is that, Operations Management is normally one of the core courses in most business major at both undergraduate and graduate levels; while Supply Chain Management topics are usually included in the Operations Management courses. Therefore, Operations Management courses are the main sources for most business students to be exposed to concepts and applications in Supply Chain Management. We also realize that there are growing SCM courses offerings all over the world. Therefore, we include the study of both OM and SCM course syllabi and use the results for comparison with the industry demand data. Then, we perform cluster analysis by comparing demand and supply data. The following Exhibit 3 shows the supply-demand analysis based on the 17 OM syllabi data and the industry job data.



Cluster	Demand	Supply	Mismatch
A	Medium	Low	Under-Supply
B	Medium-High	Low	Extreme Under-Supply
C	Medium-High	Medium-High	Match
D	Medium-High	High	Match
E	Low	High	Over-Supply

Exhibit 3: Industry SCM demand versus OM syllabi topics coverage

Relationship analysis of demand and supply for SCM jobs

Based on our data analysis, we have identified four factors of mismatch which results in open job positions in an economy with a large pool of interested candidates. The contributing factors for the mismatch are summarized as below.

Missing knowledge on important subject areas (supply chain under-supply): This mismatch happens due to gap between expectations of a skill set by the industry recruiters and the actual skills of the candidates as demonstrated by cluster A and B in Exhibit 3. Missing knowledge area or skill is particularly based on the recent development and practice in the industry, which has not yet been reflected in the current SCM education and has not reached the students and young professionals through academic text books. Relevant examples as the mismatch can be advanced demand and supply planning, supply chain data management, data analytics, detailed production scheduling etc.

Outdated knowledge on current industry practices (supply chain mis-supply) : Supply chain planning and management has been a very dynamic field in last 10 years with many advancements now considered as essential part of the business processes. Though, the course syllabus and sometimes the text books have not been able to keep pace with the advancement in the knowledge areas. In our research, we have found that the process to change the syllabi and learning objectives is cumbersome for most of the institutions requiring multiple levels of approval. Requirement to test the students on the learning objectives taught in the classroom creates further hindrance and motivates the educators to teach the traditional learning objectives which can be tested through mathematical formula and numbers.

Deep knowledge on less relevant areas (supply chain over-supply): We understand that none of the areas and learning objectives as covered in the classroom is totally irrelevant for understanding the concepts of supply chain management. But, considering the limited course time, we found some subject areas should be reviewed to be for their value proposition to remain in the course. Based on our research, we have found that heavy mathematical modeling based on linear programming consumes a big part of the

class room and students self-reading time. Though, with the development of sophisticated technology tools, people employed in the supply chain management roles no longer perform these calculations manually.

Lack of soft skills (supply chain under-supply): Besides all these important quantitative skills and tools, the knowledge and skills on human factors in SCM are also in urgent needs. As one area within management, SCM mainly focuses on the interaction among different business parties, which requires not only the quantitative ("hard") skills as listed in our study, but also, or even more importantly, needs the communication, negotiation and human skills. Lack of these skills in the candidates also contributes to open job position or failed interview. As captured in the demand category of this paper, there are some essential skills like working in teams, problem solving, attention to details, mobility; which are expected in the supply chain management professionals. In our research, we have found that some of the students specializing in operations management lack the people skills and they consider the interpersonal people skills more relevant for a marketing career. Though, due to sheer integration of the business processes and functions, it is expected that managers working in SCM area should have good people and soft skills along with willingness for a reasonable geographical mobility.

CONCLUSION AND RECOMMENDATION

Based on the four main areas of mismatch discussed in last section, we make recommendations to different interested parties in this supply chain of SCM professionals.

Recommendations to education institution: Based on our analysis, we recommend that education institutions involved in teaching supply chain management subject through undergraduate and master level courses need to accept and appreciate the dynamism of supply chain management as a knowledge area. Institutions are recommended to have more collaboration with the industry for a symbiotic relationship. The course should aim to enhance the skills in people management, negotiation, communication and team work through focused courses, group work, projects, team simulation etc. Technology integration in the supply chain management course is another recommendation to the institutions.

Recommendations to industry: Organizations are recommended to take actions to solve the supply chain management talent crisis both for the short term and for the long term. For the short term, we recommend the organizations to identify the internal talent with related skills, and then provide the holistic training on supply chain management subjects before filling the critical positions in supply chain planning and execution functional areas. For the long term strategy, collaboration with the education institute is critical. Working with the institutions through knowledge sharing and research support will help developing the right talent who can fill the positions in future.

Recommendation to students and professionals related to SCM: We recommend students to take ownership and plan their career. Students are recommended to assess their soft skills with the sector's expectation before investing time and resources in learning the relevant technical skills. Students should take initiatives to update their skills and knowledge through current advancements in the subject.

To conclude, in this paper, we study the supply chain of SCM professionals. There is clear imbalance between the demand from industry and the supply from the higher education institutions. Through demand and supply analysis, we found four main areas of mismatch and we make recommendations to all related parties.

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