
Knowledge Management In Aerospace Sector

Knowledge management is often perceived as a key enabler to bridge the gap between strategizing new management practices and their correct application in an organization. Knowledge management improves the identification and transfer of best practices and prevents the repetition of mistakes. In the present modern times, aerospace companies face a global competition in manufacturing and services, which compels them to improve their core competencies by constantly adapting and learning to the ever-changing business environment.

Through the insight and knowledge gained from the 6 modules of the course, a number of various major barriers to effective knowledge exist despite the availability of technical and scientific information available to multinational firms and potential users all over the globe. First of all, there are decisive reports stating difficulties in obtaining appropriate information for problem solving and associated decision-making policies. Secondly, there is a very low level of support for knowledge transfer in the projects and companies which depicts that transfer of knowledge is not considered at par with the knowledge production in the research and development arena. Third, rapid advances and innovation in various scientific and technical spheres can only be fully exploited if there is efficient influx of knowledge management. The NASA/Department of Defence Aerospace Knowledge Diffusion Project identified these major barriers to examine both the social system and information communication process of the aerospace sector at individual, organizational, national, and international levels. The above-mentioned project laid down two important assumptions that the rapid diffusion of technological developments requires proper knowledge management and secondly, the production and transfer of knowledge is as important as the components of the aerospace knowledge diffusion process.

ERP in Aerospace Sector and It Being a Precedent of Knowledge Management

The implementation of Enterprise Resource Planning (ERP) in the aerospace industry is revolutionary in every sense and it was very important to implement a centralized software which could handle the important systems of a company because many of the aerospace companies, especially the government organization like United States Air Force still use decades old legacy software for enterprise management [].

The Aerospace and Defence industry doesn't have simple consistency like other industries because of so many related variables like politics, terrorism, military funding, enhancement in technology, etc. Airlines have no idea when the next volcano eruption can cause global air traffic disruption, or the impact of sudden increase of aviation fuel in economic trends. Unpredictability and a transforming industry create a specific set of challenges for the aerospace organizations. ERP should be able to accommodate this complex matrix when managing process and the end-to-end support chain [2]. Both defence and aviation organizations now have firm dependencies on the industry to meet operational objectives. Combining knowledge management with other management systems and tools like ERP and supply chain management is an integrated approach to harness knowledge resources efficiently and effectively. ERP system should be agile and reactive towards longer term digital

transformational trends. According to the research paper [], I could narrow down four ERP selection parameters which are basically four key areas of enquiry. Firstly, the system should have a modular construct so that it can support company's transformation and related revenue streams. Secondly, the aerospace industry needs something bigger than standard ERP solution which can provide functional depth so that they can focus more on in-service support module which I have discussed in the next paragraph. Third, the ERP solution should be receptive and be reactive enough to adapt new industry and digital transformation trends. Lastly and most importantly, the business intelligence capabilities and module integration should be in-sync so that it fits the functional needs for operations and track the strategic goals laid down by the customer []. Tacit knowledge in today's world is a source of soft power that can provide an edge and competitive advantage to the organizations.

Integration of Digital Technology with MRO Industry and Innovation Diffusion

Major companies like Deloitte and SAP have identified the fact that the lifetime cost of a product and the revenue through in-service support can span multiple decades. Proper focus on system agility and the functional depth around maintenance, logistics and Enterprise Asset Management (EAM) can support the company's evolution into a services-focused company which can excel at providing asset availability [3]. Major players have identified the value of in-service support and the importance of the striving Maintenance, Repair and Overhaul (MRO) industry [2]. It is evident that the equipment lifespan is increasing and in the defence sector, long in-service life periods mean high in-service costs. I researched about the 5th generation military jet-F35 fighter and to my surprise, I found out that manufacturing and procurement constitutes only 20% of the total costs whereas 80% of the costs is spent through-life on in-service support. According to SAP, about 9-10% saving can be achieved on in-service support which eventually through ERP solutions as they have the capability to change the MRO industry and its associated supply chain [3]. Traditional scenario involves unplanned maintenance through manual time-based inspection planning and there is no real-time holistic view of revenue stream and asset performance whereas the new digital scenario involves dynamic maintenance management based on anomaly detection, predictive forecasting and optimization of return on assets across lifecycles.

Conclusion

Through the knowledge gained from the module primes and academic papers, the knowledge management is a relatively new concept but is rapidly being recognized as an objective critical task. The value propositions of knowledge management and innovation diffusion are obvious but still many organizations struggle with managing and defining knowledge that resides within them. I feel there is a critical need to control and manage both material and information flows in order to achieve coordination and integration among departments within the company and efficient relationships with contractors outside the firm.

As identified in the NASA-Department of Defence project that from the perspective of resource-based view, combining both tangible and intangible resources produce favourable and efficient outcomes. In contrast to the positive effects of ERP, its implementation if not done in a right manner, can sometimes prove to be a nightmare. I learnt that there exist a few major blunders in ERP selection for the aerospace industry which reported huge losses due to imperfect

analysis and absence of knowledge sharing within the parent company. One such big case is of the US Department of Defence which tried to deploy an ERP solution called Expeditionary Combat Support System (ECSS) to manage 3,400 high-tech aircraft and 330,000 personnel []. The system was unadaptable due the mismatch of military processes in the system and unsatisfactory integration of the military modules which has eventually caused a loss of \$1 billion till date []. The reason behind the failure in the above-mentioned project is clearly due to the inefficient information process flow within the organization which could have been avoided with proper analysis and knowledge management.

The industry boundaries are blurring, and vertical integration is becoming increasingly important to prevent aerospace manufacturers from getting boxed in by the customers and suppliers who are moving up the value chain. SAP and Oracle have done important reviews on the vertical integration and stated that the new players which are using new technologies like Big Data and machine learning, incorporated with new ERP technologies will specialize more in the aerospace sector, but the question which still arises is whether these business innovations will be managed efficiently or not.