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APS1013 Applying Innovation in Engineering – Final Team Projects, Fall 2011**Development of Growth Strategies for Manufacturer of Machinery and Solar Equipment**

This report focuses on four main themes: the current markets, the future markets, the value, and the management of knowledge.

Our client manufactures industrial machinery and equipment used for Solar PV installations. The basis of this report is to study and analyze the client's current revenue growth levels and make recommendations based on our results and observations.

**Current Markets:**

The current markets segment of this report focused, primarily, on the NA and Indian markets. Analyzing the health of the manufacturing sector in both these regions and drilling down into sectors that are expected to grow in the short or long term. As such the team found that the manufacturing industry is growing in India and on the cusp of strong growth in NA, especially in the automotive and infrastructure industries. Looking at the information presented, the team made recommendations to the client to aggressively pursue new market entrant opportunities in the NA automotive sector, as well as to maintain their market share in the, slightly, contracting construction market. With respect to India, we believe that the automotive and infrastructure sectors can only improve and as such we recommend the client use its presence and global reach to position itself to gain market share in that region.

**Future Markets:**

The developing markets, namely Brazil, Russia, India, and China or BRIC, promises tremendously potential growth. The client already has operations in India, and Russia's economic activities are closely tied to Europe. As a result, only Brazil and China were investigated. Brazil is the 7<sup>th</sup> largest economy in the world with a growth rate of 7.5% in 2010 and they are set to host the 2014 World Cup and 2016 Summer Olympics. It is expected that the tournaments will bring \$61 billion CAD into the Brazilian economy. However, there are no incentive for the client to establish a facility in Brazil other than the jump start provided by the World Cup and the Olympic. The metal-forming machine tool market is only estimated to be \$1.83 million CAD in 2030 compared to \$265.28 million CAD for China. China, on the other hand, is the 2<sup>nd</sup> largest economy with an average growth rate of 9% per year. The Chinese economy is set to become the biggest economy with a few decades. Therefore, our recommendation is to consider in establishing a presence in China through a JV to minimize risk and only consider Brazil if good business relations and opportunities exist.

We examined three solar markets that are of interest to our client; Canada (Ontario), India and the United States. The solar market is government policy controlled and rigged to favour indigenous suppliers. There is an abundant market for solar modules in each of these three markets; \$4.5 billion and \$20 billion over 5 years for Ontario and the US and about \$6.6 billion over 20 years for India. Based on the current dynamics of our client's solar and machinery operations we recommended to focus resources on the Ontario market with an aggressive sales drive, ignore the American market due to over saturation and consider the Indian market only if the client is willing to invest in a new facility.

**Value:**

Through observation and research the team concluded that our client does not possess many significant weaknesses within their sale, design and manufacturing methodologies. However upon further discussion of their future strategies, the team realized some recommendations can be made to propel these strategies moving forward. The first strategy we support is the idea that the client should provide "Solutions" and not just machinery. The second strategy we support is the cultivation of innovation. After performing an extensive literature review, it has been concluded that firms that focus on the distinction between products

and services are shortchanging their own ability to innovate. We argue that service-logic innovation is a customer-oriented term and, as such, demands no artificial product-service dichotomies. Instead, managers benefit from viewing innovation from an entirely new service-logic perspective. We first challenge traditional approaches to innovation, then propose the new service-logic innovation perspective.

Management of Knowledge:

After interviewing various of our client's stakeholders it was evident that problematic information flow and lack of methodical knowledge management contributed to the creation of a bottleneck in the sales' stages S1 to S8. This bottleneck in hand leads to reduced sales and revenues, and thus was deemed an important issue to address. The team proposes the creation of a database where the most important previous designs of machines will be recorded. Every machine's functions and sub-functions will be identified, analyzed and assigned cost values. The sales people and engineering will have access to the database and use the analyzed information to better, faster and more accurately provide price estimations to clients, by comparing requested machines to previous similar designs. Also the use of the database will reduce the duplication of effort as engineering will have comprehensive knowledge of what designs have already been produced and thus will not design the same machine or part all over. Furthermore the team suggests that requirements are gathered in a more structured method, with the use of standard form. This form will be filled out by a sales person when contacted by a client, and sent to engineering to formulate a more accurate price estimate than the one initially given and start working on the design. The form will reduce the information lost between engineering and sales, and improve the quality of this information.