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Enhancing SMEs' data analytics capability through university tie-ups

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The SMU-X initiative motivates students to apply their knowledge in solving real-world problems with mentorship by professors and industry partners

By Gary Pan, Seow Poh Sun and Benjamin Lee

HARNESSING the power of data analytics, SMEs can now generate visualisations of the company's historical data to date, and predictions for the future – something which is nearly impossible before the era of big data.

For example, an SME can analyse incoming data, such as sales records, marketing patterns, and growth metrics of the company, and create dashboards for easier visualisation of the trends.

The company can also deploy data analytics to support the making of critical business decisions that include new product development, investigation of supplier or production issues, formulation of product pricing and promotion strategies.

While most would agree data analytics could bring significant benefits to SMEs, nevertheless, many SMEs are still relying on ballpark estimates to make key strategic decisions, rather than hard data from scientific calculations.

A major obstacle for SMEs is that many are still operating as traditional, non-digital businesses, and they perceive data analytics as "mumbo jumbo". Due to lack of knowledge, many SME business owners also feel intimidated adopting data analytics practices. They simply do not know how they could leverage their existing data to make better decisions. Furthermore, there is also this issue of having a lower priority of allocating budgets for long-term planning and data analysis.

An SME-University partnership model

To overcome the adoption challenge, SMEs could consider enhancing their data analytics capability by partnering universities through faculty mentored student projects. SMEs may benefit significantly from such partnership.

These benefits could include additional manpower for value added projects; faculty guided consultancy; potential new hires who are exposed to the industry and have the knowledge of the company; exchange knowledge with faculty and students; innovative solutions from millennials; and examine exploratory projects which may be overlooked given day-to-day responsibilities.

The collaboration will also allow university students to better understand the growing complexities in running a SME, and build business capabilities that will benefit the overall SME sector. One such partnership that has worked well so far is the collaboration between SMEs and SMU through its SMU-X initiative, launched in 2015. The SMU-X initiative offers an experiential curriculum that motivates students to apply their knowledge in solving real-world problems with mentorship by professors and industry partners.

Using accounting as an example, since 2015, several SMEs have taken up the opportunity to collaborate with SMU School of Accountancy in one of its courses – Accounting Analytics Capstone. The capstone course is one that all SMU students that undertake the second major in Accounting Data and Analytics, take in their final year.

The hands-on capstone project represents an opportunity for students to apply what they have learnt in the accounting data and analytics curriculum to help SMEs solve complex financial analytical problems in real-world setting.

Projects completed in the Accounting Analytics Capstone course include: developing Excel/Tableau dashboards for financial performance evaluation, inventory planning, and payment and collection cycles reviews; constructing revenue and cash flow predictive modelling; conducting simulation of business scenarios on customer demand and inventory control; developing a balanced score card encompassing both financial and non-financial performance metrics; exploring impact of block chain technology and artificial intelligence on the effectiveness of audit design process.

Case study of a local food manufacturer

An SME from the food manufacturing industry commissioned a team of five accounting students from the Accounting Analytics Capstone course in January 2018 to build a financial forecasting model with both analytical and predictive capabilities. The project was subsequently completed in 14 weeks.

The food manufacturer had been keeping track of more than 40 varieties of food products in different packaging designs and weight. In addition to the various retail packaging formats were the customisations for private labelling, again in different packaging, weight and quantity for different customers, hence resulting in too many stock keeping units (SKUs) to manage, and also the problem of holding too many raw materials and packaging materials.

Another issue for the food manufacturer was that ideas of venturing into new and different markets had surfaced before, but they did not materialise.

The big deterrence to further global expansion was the absence of important supporting information, such as operating costs, return-on-investment, production quantity, and so on. This information was a must to assess the potential risk of investing in different foreign markets, and its absence ultimately determined the overall expansion strategy.

Thus a key value proposition of data analytics was that it could help the company to visualise what the future holds, and hence justify decisions made.

With the company's historical sales data, the analytical findings revealed seasonal buying patterns by local consumers. It also showed the products which were most responsive during those periods.

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For instance, a spike in consumer demand was reported during the festive months of December to February every year, which coincided with Christmas, New Year and Chinese New Year celebrations; and which were the most popular food items bought by Singaporeans during this time. Acting on these patterns, the food manufacturer could now manage the supply chain process more efficiently during the festive period by adjusting the procurement of raw materials, and managing production, marketing, distribution and warehousing suitably to cater to the increased demand.

Using predictive analytics, the company could calculate the likelihood of success when introducing a new product in a new market. The predictive model suggested a few countries that had market potential for the specific food item consumption, and based on the preferred manufacturing quantity, it would also calculate the start-up costs, the sales volume that would enable the company to breakeven, the return-on-investment and the expected profit following five years of operations.

The predictive model also helped to quantify the potential reduction in revenue of well-established products upon market introduction of a new product variant under the same family brand.

Throughout the project, the student team had to brainstorm on possible actionable insights and recommendations using the financial model they developed. Overall, the experience for the SME and SMU was definitely a beneficial one with several takeaways.

Through the partnership with universities, SMEs could gain a completely new perspective to some of their problems, and sometimes even learn of a novel and effective solution to an issue. Additionally, they could work with some of the students prior to recruitment visits. We foresee such collaboration between SMEs and universities to grow in the years to come.

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