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Digitalisation of SMEs in Singapore: An institute of higher learning-enterprise partnership model

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AN INSTITUTE OF HIGHER LEARNING-ENTERPRISE PARTNERSHIP MODEL

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Digitalisation describes how digital (and disruptive) technologies such as Internet of Things, Big Data Analytics and Artificial Intelligence, etc. can be used to optimise existing business processes, hence allowing more efficient coordination between processes that enrich customer experiences and enhance business value. An illustrative example in digitalisation involves establishing visualisation dashboards of sales records, marketing patterns and growth metrics, and predictive models of future revenue trends. In this way, data visualisation and modelling can support a company in making critical business decisions on formulating product pricing and promotion strategies, and developing new product lines. In addition, productivity can be raised through the automation of business processes, bringing benefits that include increased efficiency, improved decision-making, and an enhanced control environment.

While digitalisation has been observed as broad-scale institutional change in numerous industries, small and medium-sized enterprises (SMEs) are just on the cusp of digital revolution. Even though most SMEs are well aware of the merits of digitalisation, when it comes to investing in digital technologies, some would say it is a huge commitment that may not always reap returns. SMEs' slowness in adopting digital technologies could be attributed to the inertia in taking the first step towards digitalisation – often seen by many as a journey of discovery and experimentation.

A common challenge in digitalisation for SMEs is that many are still operating as traditional, non-digital businesses. Owing to a lack of digital and technical knowledge, these SME owners feel intimidated by the idea of adopting digital technologies. They are not able to envisage how digital technologies could be leveraged to help them make better business decisions and improve business performance. As a consequence, these SMEs set a lower priority for investing in digitalisation when it comes to budget allocation.

AN IHL-SME PARTNERSHIP MODEL

To overcome the inertia, SMEs could consider partnering Institutes of Higher Learning (IHLs) through faculty-mentored student projects for their digitalisation efforts. These student projects often come at low to no cost, hence potentially lowering the hurdle for SMEs to embrace digitalisation. There are several benefits to such partnership. For example, student teams taking on such projects function like a consulting team that can work on exploring aspects of the SME's operations that may be overlooked because of day-to-day responsibilities. The experience they garner from the project also allows them to understand the inner workings of the SME, making them the ideal candidates as potential new hires. Through such projects, multifaceted real-world problems could be resolved with solutions addressing technical, business, and social issues. While it may require the engagement of the SME partner – from the definition of project specifications to the evaluation of students' skills – the collaboration will allow IHL students to better understand the growing complexities in running an SME, and build business capabilities that will benefit the overall SME sector.

This partnership idea is also reinforced in both [Singapore Budget 2020](#) and [ISCA Pre-Budget Roundtable 2020](#), which advocated a closer collaboration and deeper knowledge exchange between IHLs, such as universities and polytechnics, and SMEs, so as to build an enabling industry ecosystem that enhances efforts in the digitalisation of SMEs.

DIGITALISATION OF THE ACCOUNTING FUNCTION OF A LOCAL SME: A CASE STUDY

An SME had commissioned a team of five accounting students to develop a forecasting model using analytics. The student team was from the Accounting Analytics Capstone (SMU-X) course offered by the School of Accountancy, Singapore Management University (SMU), in January 2018. For this project, the student-consultants applied their knowledge of accounting data and analytics, combining it with a multidisciplinary approach to solve real-world complex financial analytical problems that have real-time consequences.

Harnessing the powers of modern technology, a forecasting model with both analytical and predictive capabilities can offer many advantages to SMEs, which tend to have lean resources.

Issues facing the SME

The SME, which is in the food manufacturing business, had numerous issues that were impeding its growth.

It had to keep track of more than 40 varieties of products in different packaging designs and weight. In addition to the various retail packaging formats were customisations for private labelling, again in different packaging, weight and quantity, for different customers. The permutations resulted in voluminous stock keeping units (SKUs) that were challenging to manage; the company was also holding high quantities of raw materials and packaging materials.

As with many local SMEs, the SME wanted to explore overseas expansion but lacked important supporting information including operating costs, returns on investment, production quantity and more. Such information is a must to assess the potential risk of investing in different foreign markets, and its absence ultimately impeded the company's overall expansion strategy.

Value of a forecasting model

A key value proposition of data analytics is that it can help companies to visualise what the future holds, and hence, justify the decisions made.

Data analytics can be used to examine a company's historical sales figures, ascertain the seasonal buying patterns, and define the products which are most responsive during certain timeframes. For this SME, data analytics revealed a spike in consumer demand from December to February every year, which coincided with the Christmas, New Year and Chinese New Year celebrations.

With the knowledge gleaned via technology, the SME could manage the supply chain process more efficiently during the festive period by adjusting its procurement of raw materials, and managing production, marketing, distribution and warehousing appropriately, 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 the market potential for the consumption of a specific item, and based on the preferred manufacturing quantity, it would also calculate the startup costs, sales volume that would enable the company to break even, returns on investment and expected profit following five years of operations. The predictive model also helped to quantify the potential reduction in revenue of well-established products upon the market introduction of a new product variant under the same family brand.

Leveraging technology, the SME is now able to collect data and analyse its spending patterns. Such data include purchase orders, card transactions, employee claims relating to travel, and medical and

flexible benefits. The information provides answers to questions like, “Who is buying?”; “Who is selling?”; “What is being bought?”; “How many?”; “When is the transaction?” and “What is the mode of payment?”, among others, all of which are the very questions that revolve around the work that Procurement does, to add value to companies.

Exploring clustering and its variants is but the first foray into spend analytics for SMEs looking to better manage their spending. Through the use of text analytics combined with natural language processing, text information can be converted into data for more advanced analysis of expenditure data.

In risk management, text analytics can help group transactions into “high risk”, “medium risk” and “low risk” using classification methods like decision trees, k nearest neighbours and neural networks to analyse historical records. Using the analysis findings, these algorithms can predict whether a transaction is likely to be “high risk”, and Procurement can step in to block such a payment.

BENEFITS OF PARTNERSHIP

An IHL-enterprise collaboration can plug a gap for SMEs that do not wish to engage professional consultants. As the IHL teams are typically mentored by industry veterans as well as the faculty, they are able to deliver effective, workable solutions to the myriad of business issues facing SMEs.

Looking at the technology-related curricula in the IHLs in Singapore, the undergraduates would be able to help SMEs in their digitalisation journey in areas such as:

- developing data visualisation 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 scorecard encompassing both financial and non-financial performance metrics;
- exploring impacts of blockchain technology and artificial intelligence on the effectiveness of audit design process, and
- fraud detection model driven by machine learning algorithms.

Through the partnership with IHLs, SMEs could gain completely new perspectives to some of their pre-existing 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. From an education standpoint, developing good working partnerships between SMEs and academe, if done effectively, could also provide a well of opportunities to bring educational value to new heights. We foresee such collaboration between SMEs and IHLs to grow in the years to come.

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