

Getting data analytics on board at The Cage

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Abstract

This case illustrates the challenges in implementing data analytics in a small and medium enterprise. A small and medium enterprise in Singapore, The Cage, runs a sports facilities rental business that has adopted basic data analytics and enjoyed the benefits data analytics offers. Since implementing enterprise resource planning in 2016 for their business processes, it now has readily available financial and customer data. Using available data from its enterprise resource planning system, The Cage now wants to incorporate more advanced data analytics into its decision-making process. While The Cage acknowledges the impact of data analytics on its business, it encounters practical challenges in the data lifecycle, namely, data discovery, data collection, analysis and modelling building, and data governance.

Keywords

Data analytics, small and medium enterprise, information systems adoption

Introduction

Small and medium enterprises (SMEs) are vital to national economies worldwide because they increase employment and innovation opportunities (Organisation for Economic Co-operation and Development (OECD), 2017). Digitalization is a promising option to enable SMEs to compete in increasingly competitive businesses. Customer-driven decision-making and the exponential advancement of information systems and technology (IS&T), coupled with the traction data analytics (DA) is getting, encourage SMEs to adopt the technology. Lack of resources and IS&T infrastructure are, however, typical challenges for SMEs considering using DA. For this reason, many SMEs lag behind large companies in DA adoption. To fully realize optimum benefits from DA implementation, these challenges must be addressed. Multiple challenges typically relate to data, processes and management (Sivarajah et al., 2017). To illustrate, a typical data challenge is related to the ethical means of obtaining and using relevant data. Issues with data processes add complexity to DA adoption. These challenges include data cleansing, data analysis and modelling, and data interpretation. Organizational and management issues further challenge DA implementation, such as data governance and costs. Although the above challenges may occur in both large and small companies, the latter might

encounter severe problems due to a lack of resources and expertise. SMEs need to carefully analyse and decide how to proceed with DA implementation to reap benefits from this technology.

This case is of a real-world sports company based in Singapore. The company, The Cage (short for *We want to be Footballers Pte Ltd (WWTBF Pte Ltd) and The Cage Sports Park Pte Ltd*), is an SME currently looking to effectively analyse data to support its decision-making process. Implementation issues, though, stand in its way. By providing a real-world case of DA implementation in an SME, this case aims to present practical problems students would likely encounter in the workplace, and therefore, provides a comprehensive understanding of real-world challenges and issues. This case expects students to (1) understand The Cage's business problems and (2) recommend ways for The Cage to address its DA implementation challenges.

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The remainder of the article describes the case study, with an overview of The Cage and its IS&T infrastructure, as well as The Cage's efforts at DA implementation.

DA adoption

Increasingly, large and small enterprises are embedding DA in their business operations to support decision-making and engage with their customers to understand their needs. The importance of DA to support decision-making has long been acknowledged (e.g. Chaudhuri et al., 2011; Luhn, 1958; Watson and Wixom, 2007). DA has developed advanced capability; it now provides greater benefits than before due to the availability of advanced DA tools, multiple types of data, the speed of data collection, various channels for data collection, and numerous analytical techniques and tools to explore and exploit the data (Chen et al., 2012; Chiang et al., 2018). DA is, therefore, central to enterprises' success. Leveraging the potential of data and technology is deemed necessary for large and small enterprises to navigate themselves in today's increasingly complex and uncertain business environments (Baesens et al., 2016; Chen et al., 2012).

Data are fast becoming a strategic asset to enable companies to gain valuable insights about their customers and competitors. Adopting DA requires both technical knowledge and the appropriate infrastructure. While infrastructure is essential, DA benefits the organization only when the results can be strategically translated into the companies' decision-making (Chiang et al., 2018). Besides the availability of supporting IS&T infrastructure, companies adopting DA may encounter data, process and management challenges. Data challenges require companies to carefully understand what data characteristics are relevant for their decision-making purposes. Process challenges relate to the ability of companies to capture, integrate, transform and select an analytical model to process the data. Last but certainly not the least, management challenges necessitate companies to aptly manage the data and information across the business enterprise, such as being mindful of data quality, and privacy, security and confidentiality issues (Chiang et al., 2018; Sivarajah et al., 2017).

IS&T is constantly being developed to provide advanced solutions, for example, DA. Companies can leverage the technologies to enjoy potential benefits. IS&T adoption, however, is likely to present complications to companies (Fichman, 2004; Mignerat and Rivard, 2009). IS&T adoption is not only concerned with infrastructure but also changes management. In addition, employee resistance to using technology or their resistance to organizational process change due to technological adoption are among the major issues in IS&T adoption (Mignerat and Rivard, 2009). Successful IS&T adoption necessitates employees' awareness and willingness to use the technology. In addition, to optimally benefit from the technology, sustainable

management activities are required to ensure people, processes and technologies are interacting (Raguseo, 2018).

While IS&T adoption creates challenges to both large and small enterprises, the adoption decision in SMEs differs from that undertaken by large enterprises (Levy and Powell, 2005). Such a difference emerges due to SMEs' resource constraints; examples include limited managerial knowledge about IS&T, lack of IS&T expertise, lack of access to appropriate and affordable IS&T solutions to business problems, and limited financial resources (Georgiadis and Pitelis, 2012; Zahra and George, 2002). Resource constraints compel SME managers to pursue more economical and less risky IS&T adoption decisions than those by the large companies. In fact, IS&T adoption decisions in SMEs are likely to be influenced by top-down directives and the managers act alone. As a result, these decisions might be based on insufficiently detailed planning and influenced by competitive and regulation pressures (Puklavec, 2017; Thong, 1999).

The case

Sanjay Danani looks at the quarterly report sitting on his desk. He is not happy with the figures from the last 3 months. 'What else can I do? Business is slowing down. My investment in technology isn't showing me the results I want. Maybe Anthony is right. I need to bring in more technology. More advanced data analytics, to be specific. It's good to have technology, but adopting it is not as straightforward as many people think. More advanced technology means more investment. And, is this technology really worth the money? Should I go for it?'

Overview of The Cage

The Cage is an SME operating in Singapore. Incorporated in 2005, the company manages indoor soccer stadiums by renting soccer stadium slots through phone and on-site bookings. Sanjay Danani is himself a soccer fan. He and his other two friends founded the company after he spotted a business opportunity offering indoor sporting facilities to connect people through sports. He has leveraged on their first mover advantage, and The Cage continues to be a leader in the field. From its flagship premises in Kallang, the company has since expanded to the former Turf Club at Bukit Timah, providing state-of-the-art sports facilities within a 90,000 m² site.

Over time, The Cage's competition has picked up. In 2017, more than 20 venues operated by its competitors were available. To adapt to this fierce competition and customers' demand, The Cage continues to evolve and adapt to new ideas. Besides football, it now offers indoor cricket on a futsal pitch, bubble soccer and archery tag. The Cage's management intends to host more services and options. The company continues to be innovative and keep in close touch with its customers and remains true to its mission of

Table 1. SWOT analysis of The Cage.

Strength <ul style="list-style-type: none"> • First mover advantage • Customer focused (Excellent Customer Service) • Best quality equipment and facilities • Multi-product offerings (i.e. bubble soccer, indoor cricket, archery tag). Venue for birthday celebrations and corporate events • Flexible payment methods (Play and Pay later) • Operates 24/7 • Strategic location next to major malls and train station • ERP system with opportunities for data mining 	Opportunity <ul style="list-style-type: none"> • More health-conscious population (Collaboration with Health Promotion board) • Monetary credits offered by Government for use by citizens on sporting activities • High Internet penetration rate. 80% of the population (of 5.5 million) use the Internet (Leveraging social media for marketing efforts) • Fintech opportunity – to move towards a cashless mode • Low base for female customer segment. Opportunity for growth
Weakness <ul style="list-style-type: none"> • Low utilization during weekdays^a • Unequal gender distribution • High employee attrition rate • Lack of digital marketing efforts • Limited social media presence. Currently it has only its website and Facebook • Customer sensing can be improved • Mainly cash-based transactions • Inability to collect data • Lack of loyalty programme 	Threat <ul style="list-style-type: none"> • Imitable model (service can be easily replicated) • Rent on short-term lease from Government Land Authority through an open bid system • Changing preferences of youths (from outdoor sports to online games) • Failure to connect with customers who may be more tech-savvy. Not keeping abreast of latest technology used by customers • Falling birth-rates • Intense competition from competitors

This table highlights the elements in the company's strategic planning. SWOT: Strength, Weakness, Opportunity and Threat; ERP: enterprise resource planning.

^aLow utilization on weekdays after 10:00 p.m. but high on weekday afternoons because of corporate team bonding activities.

connecting people through sports. Table 1 shows the Strength, Weakness, Opportunity and Threat (SWOT) analysis of The Cage as part of its strategic planning.

Besides providing more venues and broadening their services, The Cage endeavours to find the best way to incorporate IS&T. Its management believes that IS enables the company to deliver the best service, attract more customers and enhance customer engagement. A forward-looking person, Sanjay keeps himself abreast of the latest in technological advancement. He is supported by his IT Advisor, Anthony P. V. Both men believe that business can never be stagnant, particularly at the pace that technology is developing.

DA at The Cage

The Cage's business timeline can be divided into two major milestones, which reflect how The Cage uses IS&T in its business. In the first decade of its business, which was its first milestone, The Cage's use of IS&T was limited. Customer bookings were accessed via the telephone, and the financial and customer records were managed with a spreadsheet application. With the technological limitation, The Cage encountered delay in obtaining relevant information to support decision-making. Despite these limitations, management continued to have good customer sensing due to its ability to reach out to its customers. The company also benefitted from the Singapore government's policy to actively encourage people to participate in sport and exercises.

Sanjay recalls his company's progress:

In the first five years, people wanted our products and services. That was a good, upward wave. Singapore was opening up her doors to people from other countries. A lot of foreigners came in and brought along the sports culture. During that time, business was good, because people wanted to play sports. At that time, we didn't have the technology that we have today. But we were ready. We were quite forward-thinking even in 2006. And we wanted everything to be done online, with as much technology as we could financially afford.

He smiles as he recalls the wonderful early years of the business. But his mood soon changes as he remembers,

In the last five years, though, the consumption has plateaued. We have plateaued in terms of the number of people playing sports activities. We have seen an exponential increase in technology over time. In fact, our competitors' products are not better than ours. Since we have invested in technology, compared to what we had in the first milestone, we are in a better place in terms of data and technology.

A growing trend in DA emerging in Singapore compelled The Cage to effectively make use of IS&T. In 2016, the company installed an open source enterprise resource planning (ERP) system, Odoo. The system integrates the booking system, the booking calendar, customer relationship management (CRM), project management, GST calculations and payroll functions. While previously all The Cage's bookings were made through telephone calls, with

Odoo, bookings can now be made online as well. The ERP implementation reflects the second major milestone for The Cage. The use of ERP helps the company to store volumes of essential information. Furthermore, the information can be easily accessed through the cloud.

Sanjay realizes that most companies, including SMEs, are bringing DA into their businesses. He is convinced that with this technology, The Cage will be able to analyse customer information and identify opportunities to penetrate untapped or growing market segments.

At that moment, his IT Advisor, Anthony P. V., walks in. ‘You wanted to see me? Is it about the numbers in the quarterly report?’ Anthony is prepared to have another conversation with Sanjay about increasing DA utilization at The Cage.

‘Thanks for coming in early, Anthony. I have been thinking about your suggestion to bring advanced data analytics on board. I’d like to know what is involved if we do go ahead’.

Anthony begins to outline the company’s implementation stages of technology. At the beginning, it was important for The Cage to understand what data were available and what were relevant. To date, The Cage has been collecting data in two phases. One is through phone and online bookings, and the second is through on-site bookings. *Booking* and *Payment* are two essential aspects of The Cage’s business process in providing data input. The book-and-pay system allows customers to book and pay for services provided. Through this means, The Cage collects the names of the persons who book the venues, and their email addresses and phone numbers.

When customers book the venues, they are offered two payment methods. Online customers may pay through PayPal at the point of booking. To encourage online payments, The Cage offers a small discount; for instance, patrons pay \$92 an hour instead of the standard \$96. The second payment method is available for telephone bookings. The Cage allows its customers to pay at its premises either or after their activity there. However, this method could result in no-show cases. The *play-and-pay-later mode* is both advantageous and disadvantageous to The Cage. While the advantage is that customers welcome the non-transactional relationship, as it shows The Cage’s priority to customer experience and enjoyment, the disadvantage is that The Cage has to follow up with patrons to make sure that payments are completed. Currently, the company assigns one member of staff to contact customers to request payment, mostly through SMS reminders. Sometimes, too, customers who have made bookings do not turn up, and this happens in spite of reminders. The company is still looking for ways to make this process of collecting payments from all the players a seamless one.

Sanjay motions him to pause.

You’re right. We collect data in two phases. One is when they book, and the other is when they turn up. When they are here,

the counter staff are required to eyeball the turnout to collect information on gender and number of players.

Anthony chips in,

Of course, this information comes from one person. In a game of soccer, for example, at least ten people are involved. So, I can tell you immediately, data from the other nine people is what we should collect, but we still haven’t got a chance to collect it. That said, right now, we are working out how we can do this.

The problem that The Cage encounters now is that they are only able to collect the data from the person who has booked the venues. While The Cage intends to collect data from the other players in the soccer game, the data collection process remains tedious due to demands on time. Another issue is that at present, the data available provide only limited information; hence, more useful data are needed for analysis. Collecting data other than name, residential address and email address – such as birth date and ethnic group – can potentially lead to customer resistance.

Sanjay acknowledges that The Cage needs to benefit more from data analysis, particularly in obtaining practical insights from available data. Currently, The Cage analyses its data at the descriptive level, such as, How many new customers has the company gained? How many people are playing at a particular time? What was the sales figure last week? What was it last month? and so on. The company, however, needs to use data in different ways, such as finding the correlation between two data points, and predicting future sales or peaks.

Anthony describes what The Cage has been doing when analysing current data:

Right now, what we are doing is just the most fundamental thing. There might be other stuff in the data that we are not seeing. We need people who play with numbers, plot graphs and notice patterns. For example, why are the two peaks coming up? What is the correlation between this and that?

Hearing this, Sanjay becomes energized.

What I want is to use all the data that we collect. I want to get insights from data. I want to use data fully and present information in a way that I know the authorities will look at it. This is to our advantage. It is not that I am trying to manipulate the authorities. I want to enlighten them with facts, with data. Can we do this?

Anthony, too, is getting excited. ‘Yes, we can. Absolutely! But there may be challenges’. Lack of expertise might be one of the problems for The Cage, resulting in lack of advanced DA. Although he is the IT support, Anthony knows only the basic features provided by the existing ERP. He is, therefore, keen to find other potential technologies that can help the company with more advanced

analytics. One such technology is Grafana, an open source data visualization tool.

Prior to implementing ERP in his company, Sanjay has envisioned that his company should adopt IS&T and adapt its business process as technology advances. Sanjay has always known that DA can have a strategic impact on his company. He tells Anthony,

I am very clear about what data does. To me, data is fact. It is not interpretation. It is pure, hard, cold fact. Because it is fact, I have actually used data to 'influence' authorities. I use fact that I gather and I share this fact with the authorities. Who are my authorities? My landlord. The government sector that is trying to enforce and to promote the sport. So that they get the idea that we are in the right job. If I tell it through interpretation, that is qualitative analysis. It's pointless to just say that we are very popular. But with data, for example, the number of people who come to our place, that for me is fact. I can use that fact and I send it to the authorities, so they see we should continue to get support to stay in business. So, you see, I know how decision-making can be driven by data. Data is important.

Although Sanjay believes that IS&T can have a beneficial impact on his company, he remains unsure about how to precisely measure the impact of technology, especially social media. While The Cage may use social media for marketing purposes, the extent that social media can attract customers and profits remains questionable. The Cage has tried to increase their online visibility via their corporate website and Facebook. However, the use of social media at The Cage remains fully unexplored. Sanjay believes that social media cannot be ignored as most people increasingly obtain information about a business from the Internet. He is keen to expand their Internet presence, specifically through social media platforms, to enhance customer awareness and to develop their marketing initiatives.

Sanjay elaborates,

Of course, I'd like to think there is a direct link between data analytics and social media and the bottom line. But I have not seen that link yet. Our business hasn't got those links yet. So, I cannot say for sure that A resulted in B, which resulted in C. I cannot do that. I don't have that experience yet. But I can tell you one thing: this link cannot be ignored. This much I know.

With regard to data privacy and confidentiality, The Cage ensures that their hardware and database are secure. Only authorized personnel can access the server. The Cage, therefore, is very careful about the accountability issue. Customer data are protected at The Cage, and the company does not share its database with a third party, regardless of purpose. When accepting phone bookings, for example, The Cage encourages its employees not to note the callers' details on paper. The personnel in-charge is expected to immediately key the data into the system. While customers' data are kept secure

at The Cage, no Personal Data Protection Act (PDPA) consent form is currently available at the company. Furthermore, The Cage has yet to be audited by accounting firms.

After his discussion with Anthony, Sanjay has an idea of what he might do. He tells Anthony,

I will be meeting with a consultant next week. I'd like you to compile a list of the issues and challenges that we discussed today. Let's send the list to the consultant before the meeting and see what the advice is for further DA implementation. Because of the large sum of money to invest in this technology, I want to be very sure that the benefits are worth the investment.

Discussion questions

- A. On The Cage's business problems:
 - A.1. What business is The Cage in?
 - A.2. What are the issues and challenges encountered by The Cage when running their business?
 - A.3. How does The Cage's management address the issues and respond to the challenges?
- B. On how The Cage should strategically adopt DA:
 - B.1. How strategic is DA to The Cage? Consider the industry it is in and the fixed capacity nature of its business.
 - B.2. In your opinion, how important is the role of DA in the sports industry?
 - B.3. What are the issues and challenges encountered by The Cage when implementing enhanced DA? Consider the data lifecycle challenges.
 - B.4. How should The Cage deal with the issues of DA implementation, and how should it respond to the related challenges?
 - B.5. What costs are linked to DA adoption and implementation at The Cage?
 - B.6. How should The Cage effectively use social media as a strategy in DA?

Conclusion

While digitalization is largely seen as an enabler for SMEs to compete in an increasingly competitive environment, adopting it is not always an easy process. As this case illustrates, SMEs considering adopting DA face key challenges. The case, based on a real-world sports company in Singapore, offers insights into management perspectives and concerns relating to DA adoption in an authentic setting. Through the sharing of management's concerns, students could be led to appreciate practical business problems such as DA strategy, data lifecycle challenges, optimizing use of DA for business decisions including management

perspectives on the use of social media in DA and the related cost considerations.

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