

Data and Analytics - Data-Driven Business Models: A Blueprint for Innovation

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This is a Working Paper

Why this paper might be of interest to Alliance Partners:

In this paper the authors present an integrated framework that could help stimulate an organisation to become data-driven by enabling it to construct its own Data-Driven Business Model (DDBM) in coordination with the six fundamental questions for a data-driven business. There are a series of implications that may be particularly helpful to companies already leveraging 'big data' for their businesses or planning to do so. By utilising the blueprint an existing business is able to follow a step-by-step process to construct its own DDBM centred around the business' own desired outcomes, organisation dynamics, resources, skills and the business sector within which it sits. Furthermore, an existing business can identify, within its own organisation, the most common inhibitors to constructing and implementing an effective DDBM and plan to mitigate these accordingly. Within the DDBM-Innovation Blueprint inhibitors are colour-coded and ranked from severe (red) to minor (green). This system of inhibitor ranking represents the frequency and severity of inhibitor, as perceived by 41 strategy and data-oriented elite interviewees.

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The Competitive Advantage of the New Big Data World

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We live in a world where data is often described as the new oil. Just as with oil, the value contained within data is universally recognized. As the seemingly relentless march of big data into so many aspects of the commercial and non-commercial world continues, the practicalities of constructing and implementing data-driven business models (DDBMs) has become an ever-more important area of study and application.^{1 2} Capitalizing on this data explosion is increasingly becoming a necessity in order for a business to remain competitive, and is a modern twist to the old adage, 'Knowledge is Power'. The challenges are threefold: i) how to extract data, ii) how to refine it, and iii) how to ensure it is utilized most effectively. Businesses and other organizations that fail to align themselves with data-driven practices risk losing a critical competitive advantage and, ultimately, market share and the accompanying revenue.³ For today's businesses, effective data utilization is concerned with not only competitiveness but also survival itself.

Our research suggests that many businesses are developing new business models specifically designed to create additional business value by extracting, refining and ultimately capitalizing on data.² Such innovation is notoriously difficult – particularly for large existing firms who have to contend with ingrained company structure, culture and traditional revenue streams. It is the competitive advantage associated with effective big data utilization that is driving the desire for existing mainstream businesses to become data-driven. The DDBM blueprint presented within this article is an academically secured and industry-focused data innovation platform, which organizations desiring to become data-driven or facing difficulties with data-use innovation can utilize to help construct their own DDBM.

Data-driven businesses have been demonstrated to have an output and productivity that is 5–6 per cent higher than similar organizations who are not utilizing data-driven processes.⁴ In some industries, such as publishing, big data has spawned entirely new business models. For example, after a movement towards a digitally oriented distribution model and dwindling advertising revenues, certain publishers began to accumulate data relating to their online users – users whose demographic was particularly attractive to advertisers. This data could then be sold, enabling targeted and more effective advertising. In the financial services sector trading algorithms analyze huge quantities and varieties of data, enabling the capture of value in milliseconds. It is unsurprising that 71 per cent of

banking firms directly report that the use of big data provides them with a competitive advantage⁵ – each often finding a slightly different angle to the data application.

Clearly there is value associated with effective big data utilization, and the race is on for existing businesses, both large and small, to capitalize upon it. However, although big-data-oriented publications agree on the potentially positive impact of big data utilization, very few suggest how, in practice, it can be attained and none offer a research-based guide or blueprint that can be utilized by an existing business to help create and implement its own DDBM. An example of this is a recent article published in the *Harvard Business Review*, which provides five new patterns of innovation, three of which relate directly to data and its derivable benefits.⁶ While these patterns are identified in the article, there is no systematic framework proposed to enable established organizations and business start-ups to transform an innovative data-driven idea into a feasible DDBM.

This article aims to address this apparent void by providing a foundation and structural guidelines within which an existing or new business can analyze, construct and apply its own DDBM. This can be achieved *ab initio* or with inspiration from existing DDBM examples, the latter allowing an organization to benefit from proven policies in similar organizations that have been successful with DDBM implementation. We also argue that creating a business model for a data-driven business involves answering six fundamental questions:

1. What do we want to achieve by using big data?
2. What is our desired offering?
3. What data do we require and how are we going to acquire it?
4. In what ways are we going to process and apply this data?
5. How are we going to monetize it?
6. What are the barriers to us accomplishing our goal?

In the rest of this paper we will expand on each of these questions in turn, highlighting why we think they are significant and how specific firms are tackling them. At the end of the paper we will bring all of this material together as we present our blueprint on how to become a data-driven business.

Research Approach

In order to create a blueprint that could be an effective guide for existing businesses to create and implement their own DDBMs, it was important to identify the main constituents and operation of DDBMs currently applied in both business start-ups and established businesses. The organizations analyzed were chosen randomly through literature reference frequency using a number generator method that utilizes background radiation to achieve randomness. Established businesses were chosen from five sectors (finance, insurance, publishing, retail, telecoms), which were determined through big data literature reference frequency. These sectors were then searched for on Google and the first 20 distinct businesses were pulled from the list. This left four organizations for each of the five sectors. Furthermore, samples of 100 business start-ups were taken from the start-up incubator AngelList. The start-up sample was limited to companies from the category 'big data' or 'big data analytics'. For the purpose of this article, a random number generator was used to choose 40 random

organizations from both start-ups and established businesses to demonstrate how these organizations utilize and construct their own DDBMs using the six proposed questions.

For each of the chosen business organizations publicly available documents were collected and consisted primarily of annual reports, website information and business-school case studies. Specific news articles were also obtained from financial, market and business-oriented publications such as *Financial Times of London*, *The Wall Street Journal* and *The New York Times*. In total, over two hundred sources were collected. A thematic language analysis was then conducted using the analytics software Nvivo. Each document was manually coded towards a framework developed by Hartmann et al. (2014), derived from academic literature.^{7 8 9} This process gradually deciphered the DDBM of each individual business while developing the more generalized DDBMs for established businesses and business start-ups. Validation of the thematic language analysis was achieved through qualitative research that is twofold: first, by interviews, and second, through the use of a survey – both of which were aimed at strategy and data-oriented representatives within each of the businesses. Finally, company-specific case studies were formulated as a means for further validation. An overview of the methodology utilized can be seen below in Figure 1.

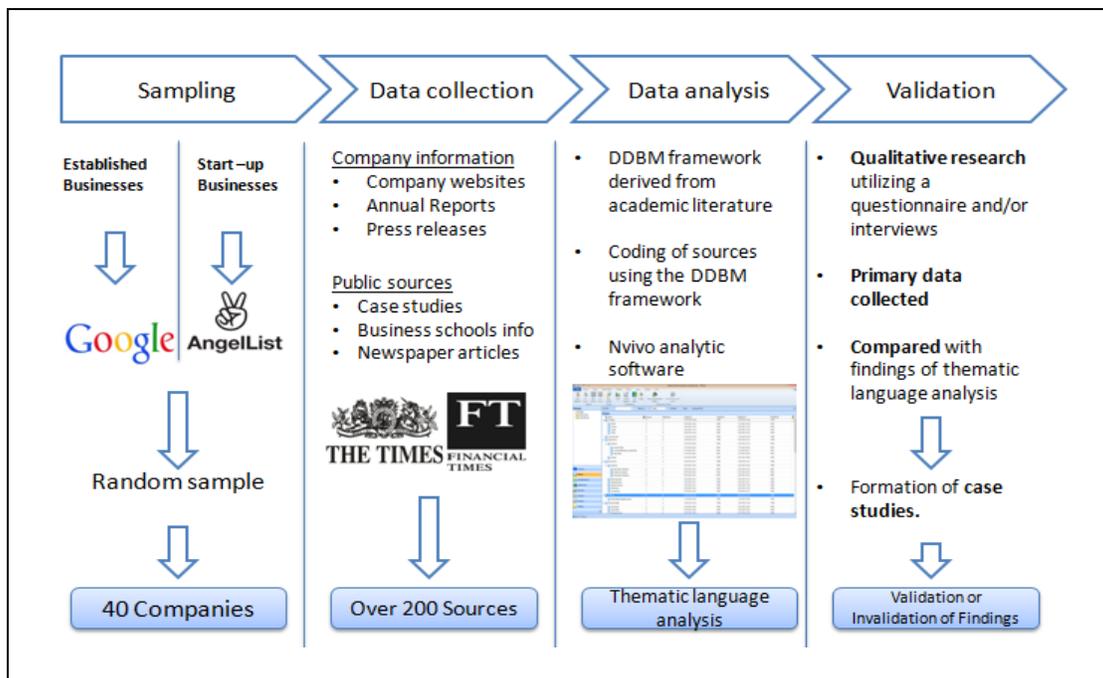


Figure 1: Methodology Utilized

The Six Questions of a Data-Enabled Business

1. What do we want to achieve by using big data?

In order for a business to effectively utilize big data it is vital that its aims are clear and realistically attainable. Often an organization understands the potential value and benefit associated with data but fails to determine a specific aim before undertaking a time-consuming and costly data acquisition and analysis process. By targeting a pre-determined outcome the business can retain its focus on a desired and realistic goal and reduce unnecessary monetary and human resource wastage during the process. Our analysis shows the following seven key competitive advantages identified by our

selected business organizations; *shortened supply chain, expansion, consolidation, processing speed, differentiation and brand*. Brand was considered to be the most important competitive advantage to established organizations, with 95 per cent of analyzed companies regarding it as a competitive advantage. This was followed closely by differentiation (90%) and expansion (70%). Shortened supply chain and processing speed were considered less significant to the established organizations we analyzed, ranging from 20 to 30 per cent of organizations regarding these as a competitive advantage. As Figure 2 shows, brand is considered the most important competitive advantage throughout all of the sectors analyzed. Differentiation is seen as important in retail, publishing and insurance. Processing speed is considered a strong advantage by the finance sector.

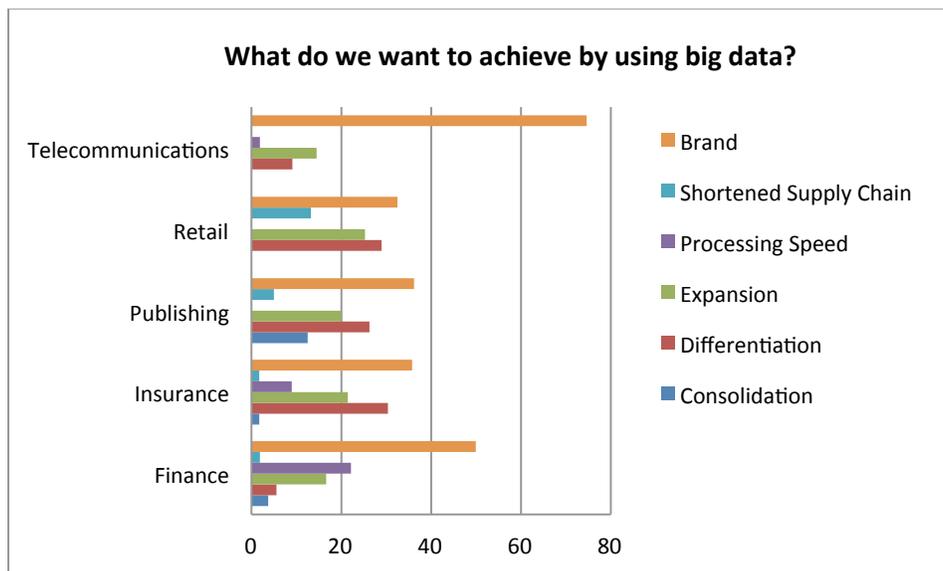


Figure 2 Demonstrating what each analyzed sector wanted to achieve by utilizing big data

The fashion retailer Zara aimed to achieve close to real-time customer insight into fashion industry trends and purchasing patterns so that it could better align itself with its customers, resulting in increased retail sales volume. Zara knew it wanted to utilize a shortened supply chain to gain competitive advantage and to structure its resources efficiently and effectively. By incorporating near real-time sales statistics, blog posts and social media data into its analytic systems, Zara is able to rush emerging trends to market. One example was the social media ‘storm’, which occurred over a dress worn by the female musician Beyoncé on the opening night of her world tour. Before the culmination of the tour Zara had already designed, manufactured and begun capitalizing on this trend in its retail stores. The near real-time analysis of large volumes of unstructured data creates potential revenues that were unthinkable a decade ago.

The online retailer ASOS instead aimed to develop differentiation as its desired competitive advantage. Although the organization incorporates a similar data strategy to Zara, it produces a much higher variety of items because it is not restricted in terms of space like the typical ‘bricks and mortar’ stores. By utilizing an effective data strategy to keep on top of industry trends, and combining this with an extensive product range, ASOS maximizes the probability of customers finding products that they want to buy.

2. What is our desired offering?

A business must decide in what way the DDBM construct will benefit the company's current offering or, alternatively, create an entirely new one. Established businesses have a tendency to utilize data to improve or enhance their current customer offering, which is often called a 'value proposition'.^{7 8 9} It therefore follows that the *value proposition* is the value created for customers through the *offering*.² A company can offer raw data that is primarily 'a set of facts' without an attached meaning.¹⁰ When data has been interpreted it becomes information or knowledge. Typically the output of any analytics activity attaches some insight or application.

Organizations are not restricted to a single offering. Established organizations, in particular, tend to have multiple customer offerings. Of the established organizations analyzed 100 per cent had an offering that was a non-data product or service, 24 per cent had information and knowledge offerings and 20 per cent had data as one of their offerings. This is not surprising considering the historical context of many of these traditional organizations and the recent advances in data-oriented activities and revenue streams. The offering reference percentage for a non-data product or service in the retail and insurance sectors was 100 per cent, suggesting that accumulated data from varying sources is used internally. A non-data product or service was also the dominant offering in the publishing and finance sectors, acquiring 48 and 85 per cent respectively. Telecommunications had a strong reference percentage for data as an offering at 50 per cent. Publishing also had a strong data offering reference percentage, attaining over 35 per cent.

For example, the mobile phone service provider AT&T increased the positive public perception of its brand after evaluating a customer sentiment analysis based upon both internal (current users) and external (potential users) data sources. This insight enabled AT&T to improve its product and service offering in areas considered most important to its potential and actual customers, thus maximizing the derived benefit from the investment.

Furthermore, organizations have to identify with those whom these offerings should target. There are several ways to segment customers. However, the most generic classification was used, dividing target customers into businesses (B2B), individual consumers (B2C)^{11 8} and consumer to consumer (C2C), which is defined as facilitating the use of customers to acquire further customers. In many cases, companies could target businesses and individual consumers. For 75 per cent of the companies analyzed, B2C was their dominant target customer. B2B customer targeting was lower, with 50 per cent of the established organizations referencing this as their target customer. The C2C business model was utilized least as a means to target-new customers, with 20 per cent of the business organizations analyzed referencing this activity. In the retail and insurance sectors B2C targeting was the dominant target customer node, attaining 76 and 54 per cent of the percentage references for their sector. A B2B target customer was referenced in the publishing (61% of references) and finance (72% of references) sectors. Organizations utilizing C2C were seen in lower percentages (<20%) in the retail and publishing sectors. In the telecommunications sector C2C was the dominant target customer, with 45 per cent of references. However, the majority of C2C references were related to one

company, GiffGaff Mobile, whose innovative business model relies almost entirely on its tech-savvy, company-integrated customer.

On the other hand, business start-ups that do not have the luxury of traditional revenue streams tend to create an entirely new offering. A noteworthy predominance of B2B business models within the examined start-up companies can be observed, whereas established businesses lean more towards a combination of both B2C and B2B. Over 80 per cent of the companies target business customers with their offerings (70% only B2B, and 13% both B2B and B2C). The vast majority of companies in the sample offer information or knowledge, which certainly relates to the selected sample. Web-based business models are predominant with start-ups on AngelList, and therefore most of the offerings are also Web-based.² For example, the start-up Farmlogs offers a service to farmers that streamlines crop and fertilizer input with satellite monitoring and weather and produces pricing patterns, increasing efficiencies throughout the farming process, thus enabling farmers to reduce unnecessary costs and improve practices and ultimately increasing revenues.

3. What data do we require and how are we going to acquire it?

Data is obviously fundamental to a DDBM. Deciding which data is most applicable, and the nature of that data's acquisition, is pivotally important to the success of a DDBM construction. Established businesses with a substantial number of customers, and therefore potential customer interaction points, are well positioned to effectively utilize customer-provided data within their DDBM, although this data is often combined with data from other sources. Customer-provided and acquired data was utilized by 80 per cent of the business organizations analyzed, with self-generated and existing data utilization slightly lower at 75 per cent. Free available data was the least exploited, with 60 per cent of the business organizations analyzed using this data source. This high utilization of all available data sources by established organizations is indicative that these organizations understand the value of data and orient themselves towards becoming data-driven.

As shown in Figure 3, telecommunications, retail and financial services consider self-generated data to be the most significant data source, with telecommunications and retail placing particular emphasis on self-generated data – probably due to their industry-specific customer interactions. Customer-provided data is utilized and regarded as important across all of the analyzed sectors, which is suggestive of established business organizations viewing data as a source of leverage.

For example, the fashion retailer Topshop combines customer-provided data, free available data from fashion blogs and social media and existing data within its own databases when running predictive and descriptive analytics protocols to determine emerging trends within the highly competitive retail clothing industry. Without these processes in place to manage and capitalize upon the valuable source of potential customer insight, the available data, fashion retailers would lose out on significant revenue opportunities.

Start-up companies have the advantage of a 'clean sheet' when constructing a DDBM, but also the disadvantage that they rarely have the luxury of a high number of recordable customer interaction points that can be utilized in their DDBM constructs. Instead they must depend primarily on external

data sources. For example, the Web recruitment specialist Gild is a start-up that scours the Internet for talented Web developers using its evaluation software to analyze online coding, which is free and available to access. Once an innovative and skilled piece of coding has been identified Gild contacts the developer directly. By incorporating free available external data into its DDBM, Gild has created an effective way of identifying outstanding emerging talent for its recruitment process.



Figure 3 Data sources utilized by the analyzed sectors

4. In what ways are we going to process and apply this data?

Methods of processing reveal the true value contained within data. Knowing which key activities will be utilized to process data enables the business to plan accordingly, ensuring that the necessary hardware, software and employee skill sets are in place. To develop a complete picture of the key activities, the different activities were structured along the steps of the 'virtual value chain'.¹² To gather data, a company can either generate the data itself internally or obtain the data from any external source (data acquisition). The generation can be done in various ways, either manually by internal staff, automatically through the use of sensors and tracking tools (e.g. Web-tracking scripts) or using crowd-sourcing tools. Insight is generated through analytics, which can be subdivided into: descriptive analytics, analytics activities that explain the past; predictive analytics, which predict/forecast future outcome; and prescriptive analytics, which predict future outcome and suggest decisions.

Our analysis showed that analytics were regarded as the dominant key activity by both established businesses and business start-ups. Established businesses utilized all forms of analytics, whereas start-ups predominantly favoured descriptive analytics and unspecified analytics. Predictive analytics (90%) was the most commonly utilized type of analytics, although descriptive analytics (80%) and prescriptive analytics (65%) were still utilized by a significant percentage of the businesses selected.

The key activities of data acquisition and generation were practised by significantly more established businesses. This may be because established businesses are positioned within a marketplace in such a way that they can take advantage of these activities. Distribution was higher among business start-

ups. This is linked to the subscription-fee revenue model option depicted in Figure 5. The inherent size of start-up businesses prescribes their tendency to present their company offering as a service requiring distribution with a subscription fee, whereas established businesses instead have a tendency to be more insular with their data and its uses to create value internally.

The telecommunications sector has a varied range of key activities. Data generation and acquisition were the key activities with the highest percentage of references, each having 14 per cent. Unspecified analytics, descriptive analytics and prescriptive analytics were also regarded highly, each claiming between 11 and 12 per cent of the reference percentage. Analytics in various forms were utilized consistently by the retail sector, with prescriptive, descriptive and predictive analytics each accounting for 12 to 14 per cent of all references and unspecified analytics accounting for over 20 per cent. Data acquisition (12%) and processing (10%) were also regarded favourably as key activities by the retail sector. In the financial services sector, where finely-tuned predictive analytic modelling influences business decisions, Goldman Sachs plans years in advance to ensure it has the capacity, hardware, processes and employee skill sets available to utilize increased data volumes and new technologies. In fact approximately 30 per cent of all Goldman Sachs’ employees work in technology and development. Descriptive analytics was the key activity, with the highest reference percentage in publishing at 24 per cent. This was followed by predictive analytics at 17 per cent, data acquisition at 15.5 per cent and prescriptive analytics accounting for 14.5 per cent of the key activity references for the publishing industry.

Retailers Zara and Topshop input both internal and external data sources into their system when running predictive and descriptive analytics protocols. The insurance sector’s key activities within a DDBM are dominated by analytics, with over 75 per cent of all references aligning to at least one form of analytics. Data acquisition was of secondary importance, accounting for 9 per cent of the key activity references.

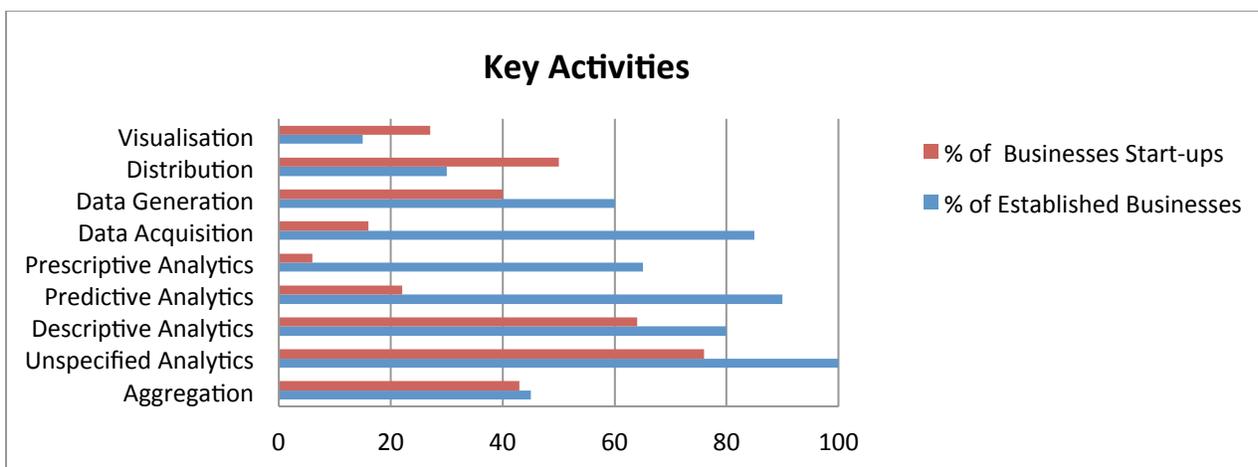


Figure 4 Key activities utilized by established businesses and business start-ups to process and apply data

5. How are we going to monetize it?

Without the target of a quantifiable benefit to a business it is difficult to justify DDBM construction and implementation. Incorporating a revenue model into a DDBM is integral to its operational success. Seven revenue streams are identified by Hartmann et al (2014): asset sale, giving away the ownership rights of a good or service in exchange for money; lending/renting/leasing, temporarily granting someone the exclusive right to use an asset for a defined period of time; licensing, granting permission to use a protected intellectual property like a patent or copyright in exchange for a licensing fee; a usage fee is charged for the use of a particular service; a subscription fee is charged for the use of the service; a brokerage fee is charged for an intermediate service; or advertising. Revenue models associated with a DDBM differ considerably from a standard subscription fee such as *The New York Times* for advertising. These models vary considerably between sectors and within industries.

Advertising is the revenue model utilized most by the established organizations analyzed, with 70 per cent of the companies practising this revenue model. Usage fee was the second most commonly used revenue model among the analyzed business organizations, with 35 per cent utilizing this, followed by renting, lending and leasing (30%), asset sale (25%) and subscription fee (25%). With the exception of finance, each sector favours advertising as its dominant revenue model. In retail over 90 per cent of revenue model references were for advertising, with 70 per cent in the insurance sector, 59 per cent in telecommunications and over 50 per cent in publishing. In the finance sector, advertising references accounted for only 22 per cent of revenue model references, with the remaining 78 per cent referencing lending, renting or leasing activities, which form the foundation of many business organizations in the finance industry. Other than advertising, the publishing sector showed a strong use of subscription fee as a secondary revenue model, with 32 per cent of references attributed to this activity.

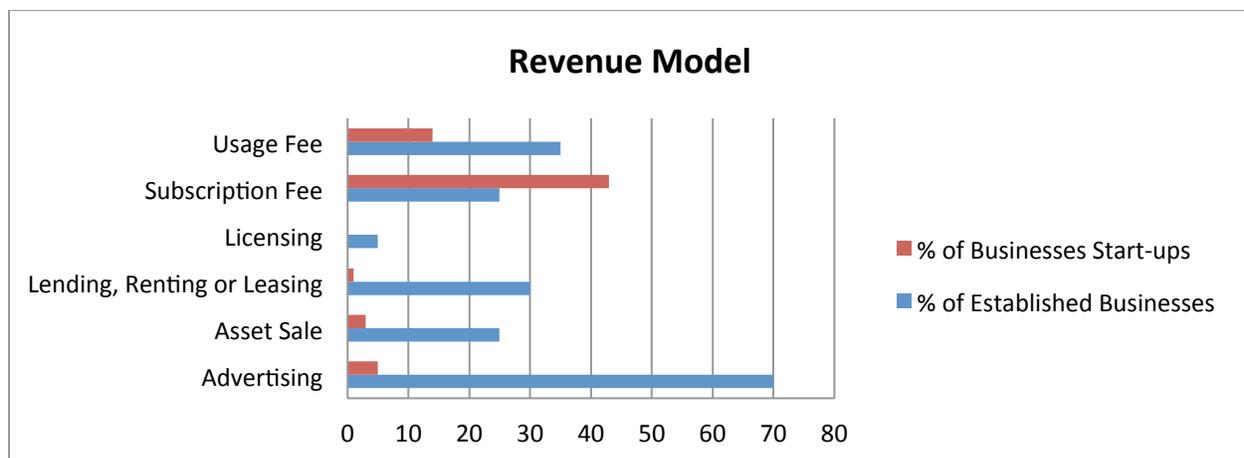


Figure 5 Revenue model utilized by established businesses and business start-ups

The variation among revenue models is much more substantial within established businesses, although advertising is presented as the dominant revenue model. *The Times* is a good example of this. The current CEO realized that as physical readership continued to decline, thus reducing revenues, a unique aspect of the company was its access to a particularly high caliber of readership. With its online offering continuing to expand, it was decided that the company would offer its content

online for free – although its competitors charged their online readers. With no-cost access, online readers of *The Times* browsed the website freely and each click and article read logged and tied the individual user preferences through his or her account. Descriptive analytics allowed *The Times* to build a profile unique to each reader, enabling them to be targeted by advertisers both on and off *The Times* website and charged at a premium because of the attractive demographic of the readers.

The revenue model for business start-ups was dominated almost entirely by either usage fee or subscription fee. Welovroi, a start-up Web application that allows marketers to directly measure the effectiveness of digital marketing campaigns, offers its services to customers in exchange for a subscription fee. Business start-ups may be inclined to utilize a usage fee or a subscription in their DDBM revenue model, as it is a consistent payment and an effective way for a start-up to maintain liquid capital.

The examples of *The Times* and Welovroi show how a business must become adaptive to the ever-changing environment within which it sits. As current technologies improve and new technologies emerge, the effect on markets, industries and individual businesses are often unforeseen and difficult to predict. Through the use of industry-focused innovation platforms like the DDBM blueprint, businesses can assess their individual position and look to capitalize upon new and emerging business opportunities.

6. What are the barriers to us accomplishing our goal?

Interestingly, our research and analysis revealed clear links between specific inhibitors to the implementation of a DDBM (based upon a qualitative survey targeting strategy) and data-oriented individuals (41 elite interviewees). In established businesses that strongly agreed they had personnel issues, 100 per cent also either strongly agreed (83%) or agreed (17%) to experiencing cultural issues when attempting to implement a DDBM. Furthermore, of the established businesses that strongly agreed they had personnel issues, 86 per cent also either strongly agreed or agreed to having internal value perception obstacles to implementing a DDBM, and 71 per cent agreed or disagreed to experiencing data quality or integrity issues. This analysis is suggestive that issues with personnel may be the most severe DDBM implementation inhibitors experienced by both new and established businesses and may be linked to a variety of other obstacles to a business becoming data-enabled.

The data illustrated in Figure 6 suggests that if an established business organization does not have sufficient data-oriented and experienced personnel within its business then a company culture that is not conducive to constructing and implementing a DDBM is likely to emerge. This may also lead to the development of a negative perception of DDBM construction and implementation within the business. According to these findings, having or obtaining experienced data-oriented personnel who recognize and understand the fundamental principles and potential value of constructing and implementing a DDBM can reduce the effect of the most severe inhibitors to effective DDBM implementation. Training seminars to educate existing staff or similar instructional courses relating to the methods and benefits of DDBMs are among the tools a business may devise to reduce personnel resistance to becoming effective in applying new data-driven policies and procedures.

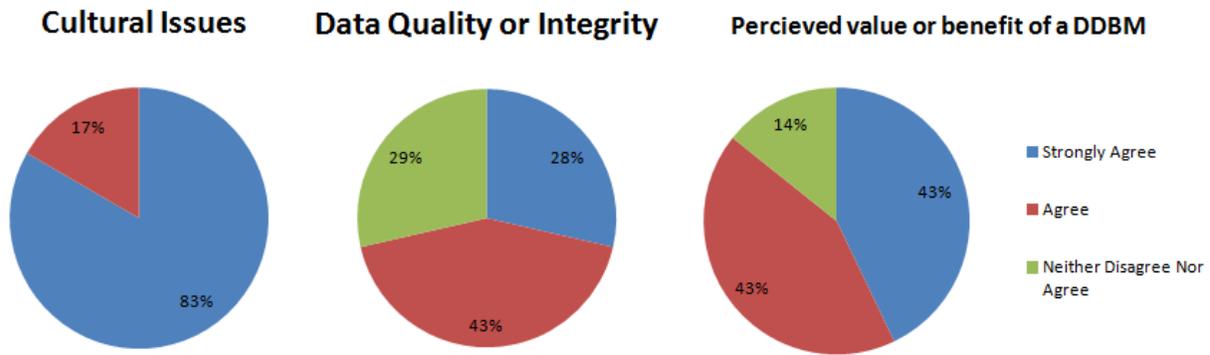


Figure 6 Perception of cultural, data integrity and DDBM perception issues by respondents who strongly agreed to personnel issues

The idea that developing a conducive company culture is integral to the effective implementation of a data-oriented business policy is present in previous studies.^{13 14 15} However, the implication that inadequately experienced big-data personnel may be the root cause of a negative or inhibiting company culture and value perception towards a DDBM is an entirely new concept and one that is worthy of further research.

The DDBM-Innovation Blueprint

The DDBM blueprint and the corresponding six fundamental questions of a data-driven business will allow existing businesses and start-ups to follow a step-by-step process to construct their own DDBM centred around the businesses’ own desired outcomes, organization dynamics, resources, skills and the business sector within which they sit. We are presenting an integrated framework that could help stimulate an organization to become data-driven by enabling it to construct its own DDBM in coordination with the six fundamental questions for a data-driven business.

An existing business can also identify within its own organization the most common inhibitors to constructing and implementing an effective DDBM and plan to mitigate these accordingly. An inhibitor to a DDBM was determined as an obstacle or barrier to the implementation of a DDBM construct or its construction process. Within the DDBM-Innovation Blueprint inhibitors are colour-coded and ranked from severe (red) to minor (green). This system of inhibitor ranking represents the frequency and severity of inhibitor, as perceived by 41 strategy and data-oriented elite interviewees.

Putting the DDBM-Innovation Blueprint to work

Further inspiration and guidance on the construction and implementation of a DDBM can be achieved by not only studying Table 1, which outlines some examples of current data-driven businesses and their DDBMs against the blueprint, but also by the business concerned conducting its own research to identify further existing DDBM examples that are aligned with its aims.

Table 1 deconstructs the DDBM construct of five business start-ups and five established businesses from a variety of sectors and how they relate to six questions of a data-driven business and the DDBM-Innovation Blueprint. The tech start-up Next Big Sound aimed to achieve unique and accurate customer insight with regards to new music. This customer insight created an offering of valuable

information and knowledge to potential customers. To achieve their desired offering Next Big Sound utilized free available data in the form of social media listings combined with their own internal system data, which then enabled their key activity, predictive analytics, to take place. The DDBM was monetized through a subscription fee to customers.

Instead of developing an entirely new product for a DDBM, Goldman Sachs instead used a DDBM to improve a current product or service. This is predominantly how established businesses have been utilizing DDBMs, by using data to enhance a proven traditional revenue stream rather than risk starting an entirely new one. Acquired data from an external source was evaluated using predictive analytics to improve the lending and renting efficiencies and margins within the organization.



Figure 7: The DDBM-Innovation Blueprint

Table 1: Showing examples of analyzed DDBMs in both established organizations and business start-ups

Established Organizations							
Company Name	Sector	1. Target Outcome: What are we trying to achieve?	2. Offering: What is our desired offering?	3. Data Source: What data do we require and where are we going to acquire it from?	4. Key Activities: How are we going to utilize this data?	5. Revenue Model: How will we monetize it?	6. Inhibitors: What are the barriers to us accomplishing our goal?
Zara	Retail	Customer insight	Non-data product or service	Free available data, customer-provided data and existing data	Prescriptive and descriptive analytics	Advertising – aligning products to customer wants	Cultural problems, value perception of a DDBM
AT&T	Telecommunications	Brand awareness	Non-data product or service	Customer-provided	Data acquisition and analytics	Advertising	Data privacy obstacles, cultural problems
The New York Times	Publishing	Competitive advantage	Non-data product or service	Customer-provided	Analytics	Subscription fee	Cultural problems, value perception, personnel issues
ING Direct	Insurance	Customer insight/competitive advantage	Non-data product or service	Acquired data, customer-provided	Predictive analytics	Advertising	Data availability and accessibility, departmental collaboration issues
Goldman Sachs	Finance	Product/service improvement	Non-data product or service	Acquired data	Predictive analytics	Lending or renting	Data quality and integrity, legal obstacles
Start-up Organizations							
Swarmly	Technology	Customer insight	Information/knowledge	Self-generated data (crowd sourcing)	Aggregation	Advertising	Data quality and integrity issues
Gild	Recruitment	Market share	Information and knowledge	Free available	Descriptive analytics	Subscription fee	Legal challenges
Welovroi	Marketing	Customer insight	Data	Customer-provided, external data	Aggregation	Usage fee	Data accessibility and integrity
FarmLogs	Technology management	Service/product improvement	Data	Internal data, free available data	Predictive analytics/data integration	Subscription fee	Cultural problems, data privacy obstacles
Next Big Sound	Music	Customer insight	Information and knowledge	Free available data, internal data	Predictive analytics	Subscription fee	Data quality and integrity issues

Summary

The DDBM blueprint and the corresponding six fundamental questions of a data-enabled business are academically secured, research-grounded and industry-focused constructs. The concepts within this research were developed utilizing publicly available company documents, and validation of these concepts was achieved through interviews, surveys and a workshop with data-oriented company representatives. Further validation was obtained by analyzing current data-driven businesses and their DDBMs against the blueprint and corresponding questions.

Managerial implications for the DDBM-Innovation Blueprint are as follows:

- i. By utilizing the blueprint an existing business is able to follow a step-by-step process to construct its own DDBM centred around the business' own desired outcomes, organization dynamics, resources, skills and the business sector within which it sits.
- ii. An existing business can identify, within its own organization, the most common inhibitors to constructing and implementing an effective DDBM and plan to mitigate these accordingly.
- iii. Further inspiration and guidance on the construction and implementation of a DDBM can be achieved by not only studying Table 1, which outlines some examples of current data-driven businesses and their DDBMs against the blueprint, but also by the business concerned conducting its own research to identify further existing DDBM examples that are aligned with its aims.

As the advantages of big data utilization become continually more profound, organizations are forced to incorporate innovative data-driven practices into their business strategy or risk losing competitiveness, market share and ultimately revenue. The DDBM-Innovation Blueprint enables organizations to construct their own DDBM that is unique to their business and environment. Data has now become invaluable to business, so much so for most businesses with aspirations of growth or long-term survival that it should no longer be a question of whether they should become data-driven but rather how and when.

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