

Relating Analytics to Strategy, Culture and Personalities involved in Decision Making

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Abstract

The field of Analytics is a new area of research, and management scholars are looking at this area closely. We make a small attempt to make a contribution in this area. Typically we relate descriptive, diagnostic, predictive and prescriptive analytics to strategy types, some dimensions of culture; and present few testable hypotheses.

Key Words: Analytics, Strategy, Culture and Personality Types

1. Introduction:

Here we give types of strategies (2 and 4) and analytics (5 and 6) and relate them to culture and personalities involved in decision making. Below we give these.

Data analytics is the process of examining data to reveal patterns, trends & associations. The purpose of this analysis, for business entities, can be divided into four categories.

- (a) Descriptive Analytics: The purpose of this type of analysis is to find out 'what is happening in a business entity'. Common examples of Descriptive Analytics are company reports that simply provide a historic review of an organization's operations, sales, financials, customers, and stakeholders. Respondents to APQC's survey indicate that descriptive analytics is the most commonly used form across all areas of supply chain, including quality management, procurement, process management, logistics, supply chain planning and manufacturing.
- (b) Diagnostic Analytics: The purpose of this type of analysis is to find out 'why something is happening' or 'why something has happened in the past'. It is characterized by techniques such as drill-down, data discovery, data mining and correlations. It starts at the beginning of descriptive analytics and extends to predictive analytics. Usually, the outcome of this analytics is a dashboard.
- (c) Predictive Analytics: The purpose of this type of analysis is to give a probabilistic estimate of 'what will happen' if the things keep happening in the same way. The goal is to go beyond knowing what has happened to providing a best assessment of what will happen in the future. Predictive analytics brings together advanced analytics capabilities spanning ad-hoc statistical analysis, predictive modeling, data mining, text analytics, optimization, real-time scoring and machine learning. These tools help organizations discover patterns in data and go beyond knowing what has happened to anticipating what is likely to happen next.
- (d) Prescriptive Analytics- The purpose of this type of analysis is to find out 'what should be done'. Prescriptive analytics can also suggest decision options for how to take advantage of a future opportunity or mitigate a future risk, and illustrate the implications of each decision option. In practice, prescriptive analytics can

continually and automatically process new data to improve the accuracy of predictions and provide better decision options.

Firms use different type of strategies, and authorities have classified firms as given below.

- (a) **Cost Leaders:** These firms try to focus on cost reduction to maintain their edge in the market. They are the cheapest manufacturer/provider of a product. It does not mean that they compromise on quality. The cost leadership strategy usually targets a broad market. Some of the ways that firms acquire cost advantages are by improving process efficiencies, gaining unique access to a large source of lower cost materials making optimal outsourcing and vertical integration decisions, or avoiding some costs altogether.
- (b) **Differentiators:** These firms try to maintain their edge by offering products with unique features which are valued by their customers. The customers perceive the product to be better than or different from the products of the competitors. The value added by the uniqueness of the product may allow the firm to charge a premium price for it. Because of the product's unique attributes, if suppliers increase their prices the firm may be able to pass along the costs to its customers who cannot find substitute products easily.
- (c) **Innovators:** These firms try to maintain their edge by focusing on innovation i.e. offering new type of technology and products which cater to the unmet demands of customers. These companies have too much focus on research and development.

Analytics can help companies maintain their edge but implementing it as part of their business strategy remains a challenge. An APQC survey indicate that only 5% respondents consider their organizations use of analytics in addressing strategic supply chain challenges to be effective. Companies in each of the above categories may have large amount of data generated through their activities but utilizing it for their advantage is not easy. It will depend on what strategies a firm adopts in their day to day activity.

2. Theory Development:

It is a common feature of cost leaders that all their strategies are focused towards cost cutting. They have high degree of formalization, specialization, standardization and centralization. The complexity of work flow is low for them as their work flow path is streamlined. Vertical Integration is high for cost leaders i.e. they prefer to manufacture in house. They have high bargaining power with their suppliers. Their workers are singly skilled. Their incentive system is mostly based on individual performance. They usually focus on continuous improvement. As these companies have an ability to see their entire range of operations at one go and the uncertainty in their activities is very low therefore they will not stop at descriptive and diagnostic analytics but will go for predictive and prescriptive analytics to make the best use of this tool. In cost leaders, even though optimal solution is NOT possible, then heuristics can be used for Predictive and Prescriptive Analytics.

So we propose the following hypothesis:

H1. Implementation of predictive and prescriptive analytics would be easier for cost leaders (compared to differentiators and innovators).

Differentiators mostly focus on making their products unique. The degree of formalization, specialization, standardization and centralization is low in differentiators. The complexity of work flow is high for them as their work flow path is far from being streamlined. Vertical integration is low for them i.e. they prefer to outsource. They have low bargaining power with their suppliers. Their workers are multi skilled. Their incentive scheme is mostly based on group performance. They usually focus on architectural innovation. As the operations of these companies are complex and varies widely in order to maintain uniqueness of their products therefore they may not be able to see their entire range of operations in one go and their analytics may be limited to descriptive and diagnostic. The available data with them may not help in predictive and prescriptive analytics.

It has been reported in literature that “Machine Learning” has around 90% (see 5 and 6) failure rate. It could be because underlying technology is still in nascent state. Also it could be because uncertainty is very high in differentiators. So we have the hypotheses as stated below.

H2. Implementation of predictive and prescriptive analytics for differentiators would be difficult.

The best strategy for differentiators would be to analyze ‘why’ of a particular phenomenon and then to act based on the insights obtained. As they have to continuously change their strategy based on the market conditions therefore they cannot go for long term predictions or prescribed solutions.

H3. Implementation of diagnostic analytics for differentiators would be easy and most effective.

If patent regime is unable to protect IPR then (even otherwise) a bureaucratic structure needs to be created so that crucial knowledge can be protected. With the introduction of analytics, entire knowledge tends to become explicit (as opposed to implicit). Everyone knows almost everything about the firms in a given industry. Hence it is a challenge to protect knowledge in a given firm.

H4. Innovators and Differentiators will have a bureaucratic culture (apart from the other cultural dimensions such as low power distance and low uncertainty avoidance (as suggested in (1)) enveloping the organizations.

In case analysis, frequently it is asked what information is needed for better analysis/decision making ANALYTICS would make that information available. Hence we have the following hypothesis. Kritika et al (1) have argued that BiG Data Analytics will reduce risk, and lead to better ‘integration’ of different divisions in an organization. We argue here that risks may not be reduced (as it is inherent due to high environmental uncertainty) but it will enable decision makers take calculated risks.

H5. With analytics decision makers will be able to take calculated risks even as environmental uncertainty is high (as opposed to using BOLD process in low uncertainty environment).

Krittika (2) have argued that decision makers using ANALYTICS need to be Perceptive (as opposed to Judgemental). But we argue that in cost leader strategy type, decision makers need not be too much perceptive as it is a case of low uncertainty, and vice versa in the case of differentiators and innovators.

So we propose the following.

H6. Decision making unit (DMU) in a cost leader organization should be composed of predominantly Judgemental type of personalities.

H7. Decision making unit (DMU) in a differentiation and innovation type of organization should be composed of predominantly Perceptive type of personalities.

3. Conclusions:

In this paper we gave interesting hypotheses relating analytics, strategy, culture and personality. We are in the process of carrying an empirical investigation; and we will get back with empirical results as soon as possible.

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