

International Conference on Knowledge Management, ICKM 2016, 10-11 October 2016, Vienna, Austria

## Using knowledge management to give context to analytics and big data and reduce strategic risk

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### Abstract

At the moment, the phrases “big data” and “analytics” are often being used as if they were magic incantations that will solve all an organization’s problems at a stroke. The reality is that data on its own, even with the application of analytics, will not solve any problems. The resources that analytics and big data can consume represent a significant strategic risk if applied ineffectively. Any analysis of data needs to be guided, and to lead to action. So while analytics may lead to knowledge and intelligence (in the military sense of that term), it also needs the input of knowledge and intelligence (in the human sense of that term). And somebody then has to do something new or different as a result of the new insights, or it won’t have been done to any purpose. Using an analytics example concerning accounts payable in the public sector in Canada, this paper reviews thinking from the domains of analytics, risk management and knowledge management, to show some of the pitfalls, and to present a holistic picture of how knowledge management might help tackle the challenges of big data and analytics.

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Peer-review under responsibility of the Organizing Committee of ICKM 2016

**Keywords:** knowledge management; analytics; big data; data envelopment analysis; Canada; processes, strategic risk;

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### 1. Introduction

Big data and analytics are currently two of the hottest topics in business and management literature and practice. Managers are bombarded with exhortations to learn about them and use them, and especially to persuade their

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company to invest in software and hardware to help them to do it. Space does not permit us to include a full discussion here of the hype surrounding these phenomena at present. On the one hand, it has all the hallmarks of a “consultancy fad”, with its tendency to be driven by IT; nevertheless, developments such as those in web analytics and real-time data do represent genuine opportunities for organizations.

We thus approach the development of analytics and big data in strategic risk management from two perspectives: strategic risk mitigant and strategic risk creator. Strategic risk can take different forms such as: reputation, industry margin reductions, economic efficiency, environmental issues, energy issues, geographical hazards, threats and terrorism, citizen-customer dissatisfaction, distribution of justice, and so on <sup>1,2</sup>. In particular strategic risk in this context is the misuse of strategic resources such as data and analytics capabilities, and reduced organization/preparedness for using analytics and data in different formats on various types of data. This misuse of resources can be converted into a competitive position change or strategic risk <sup>3</sup>. This limited understanding of what analytics and big data are can reduce the chance of improving organizational value because of unsystematic use of data, tools, methods and the synergetic process between humans, machines and data. In addition, the investment of time and resources in analytics and big data represents a very significant opportunity loss if not used effectively.

What is evident is that so many of these exhortations discuss big data and analytics in isolation, lacking any form of context. Yet context is central to any management activity. A decision is only effective in its context - sometimes it will be appropriate to increase prices; at other times, to decrease them. Data on its own, no matter how big, even with the application of analytics, will not solve any problems. Any analysis of data needs to be guided, the context being one of the factors influencing that guidance, and to lead to appropriate action. Thus it needs the input of knowledge and intelligence. Analytics can identify useful patterns and relationships, but they must be based on solid and reliable foundations - GIGO (Garbage In, Garbage Out) is as true now as it ever was.

Our example in this paper concerns accounts payable. The activities of any organization can be divided into core and support processes <sup>4</sup>. The core processes are what the organization does for its external customers; the processes that literally make the organization what it is, the ones that distinguish an automobile manufacturer from a university or an insurance company. Support processes, as the name implies, support the core processes and are done for internal customers. Accounts payable is a classic example of a support process: every organization has to make sure it pays its bills. Even though it is not part of the organization’s purpose and goals, it can still detract from the achievement of those goals, if not done well. Indeed, if done really badly, it could leave the organization unable to operate. A poor accounts payable process could be a very expensive process and thus a strategic issue to tackle for organizations. Such a process needs to be improved through a more effective approach that adds value to organizations. It can be part of implementing a more systematic approach to supplier relationship management in order to control other risks associated with supply chain and production/operations costs.

This example demonstrates that support processes too can generate big data, and does some preliminary analysis on this data using Data Envelopment Analysis, an analytics technique specifically designed to compare the performance of different organizations or operating units. We can safely assume that efficiency is the goal of accounts payable, as an accounts payable department has no choice about the things it does - it cannot choose to move into a new line of business!

We shall offer preliminary conclusions about the example, based on this pilot study, and also demonstrate the relevance of knowledge and knowledge management to steering the analytics process.

The paper is structured as follows. First, we briefly review the history of analytics and big data. We frame the issue of using analytics and big data as both mitigator and creator of strategic risk. Next we give more detail about data envelopment analysis, then explain the approach taken in our study. Following that, the example and its results so far are presented and we end with discussion and conclusions.

## 2. Analytics and big data

We take slightly unusual positions concerning both analytics and big data. Analytics we regard as a new name for a much older activity, whilst we believe that the “big” in big data is a relative term.

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