Building an Online Business Analytics Graduate Program

Emergent Research Forum Paper

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Abstract

This paper describes the process of designing an online Master of Science in Business Analytics (MSBA). The program was created to provide students with the analytical skills, tools, and techniques required to understand data sets, both large and small, from sources internal and external to an organization. This understanding of data can then be used to support business decision making and create a measurable improvement in business performance. The program differentiates itself from offerings at other schools by integrating experiential learning into each of its courses, and its curriculum is firmly grounded in business. It places an emphasis on the use and interpretation of data, not on programming or mathematics, and underscores the benefits of visualization during the data analysis process and as a communications tool for supporting decisions. An overview of the program curriculum and courses is provided, as well as the reasons behind the choices that were made.

Keywords

Business analytics, online degree program, design, curriculum development.

Introduction

There has been a steady increase in demand by businesses for employees with the skills necessary to analyze data in support of decision making. In response to this, many colleges and universities have begun offering various types of degree programs focusing on analytics. Recent survey data from the Institute for Advanced Analytics shows over 110 master’s degree programs related to analytics and data science, with over 50 of these specifically targeting business analytics (Institute for Advanced Analytics 2017).

Analytics involves the use of statistical techniques, software, and operations research methodologies to explore, visualize, discover, and communicate patterns or trends in data. In other words, analytics converts data into useful information. Business analytics is the sequential process of applying descriptive, predictive, and prescriptive analytics to business-related data, resulting in new, unique, and valuable information used to support business decision making. Business analytics goes beyond simply generating insightful information from a data source by leveraging all three types of analytics and creating an improvement in measurable business performance (Schneiderjans et al. 2014).

But while an organization as a whole may use business analytics to gain a competitive advantage, the manner in which business analytics needs to be used and understood by different individuals within an organization will vary. Data analysts may need a strong background in statistics and computer science to actively gather, process, and interpret large volumes of data integrated from various sources. Managers, however, may need just a high-level understanding of the data and its analysis, and be more focused on using the results for decision making purposes (Davenport 2015).

Given that the skill set needed for business analytics varies by individual throughout an organization, there is a need for different curriculums carefully matched to a student’s needs, background, and goals. To address this, there have been continuing discussions on how to best design and offer programs in business analytics (e.g. Schiller et al. 2015). This paper seeks to add to these discussions by providing some background and the current status of the design and implementation of an online graduate degree program in business analytics. The curriculum is being developed to specifically address the needs of decision makers within an organization who may not have a strong technical background. It does not
make any assumptions about prior formal business training, and places an emphasis on understanding and interpretation of results.

**Background**

Several years ago, Northeastern University’s D’Amore-McKim School of Business created a master’s degree in business analytics as part of a joint effort with the College of Computer and Information Science. The curriculum was designed such that students first took several courses being offered as a part of a computer science degree in data analytics. This provided students with a foundation in information management, statistics, quantitative methods, and visualization. Students then took an introductory course in business analytics offered by the business school, which built upon the core concepts of the first four courses by showing how analytics could be applied to solving business problems. This was followed by three more specialized business courses that each focused on the advanced use of analytics in a different business discipline, such as marketing, finance, or supply chain management.

The degree program leveraged expertise and resources across the two schools, and created an interdisciplinary offering that was enthusiastically welcomed by recent business graduates looking for an opportunity to continue their education in the fast growing field of business analytics. Ultimately, however, the approach did not work well for several reasons. First and foremost, business students found the computer science offerings heavily dependent on learning and using programming languages, something that they were not normally exposed to during their undergraduate studies. Another issue was that the computer science courses focused primarily on the processing and analysis of data, rather than the bigger picture of using data to solve problems and make decisions. Additionally, the required level of mathematics and analysis also became problematic at times, as instructors assumed a working knowledge of quantitative methods that undergraduate business students may not have needed in their degree programs.

What was initially viewed as a sound approach to a business analytics ended up focusing too much on analytics and not enough on business. Most students dropped out of the program before even getting to the first business analytics course. A fundamentally different approach was needed.

**Discussion**

The School of Business decided to take full ownership of a master of science in business analytics and build it from the ground up. This time an online program is being developed first, as this is considered an unmet need, but hybrid and on-ground versions are being considered for the future. The program will also offer optional activities on our main campus and branch campuses to allow physical interaction for those students who wish to participate in such events. An online degree still means that a student is part of the university and school communities, and should be able to take advantage of resources located on the physical campus if they so desire.

The newly designed Master of Business Analytics degree is aimed at decision makers at all levels within an organization. The program is organized around building three core competencies:

- Information management skills needed to manage data from both internal and external sources, including an emphasis on data quality.
- Analytical skills and use of tools required to understand data sets (large and small), including the integrated use of descriptive, predictive, and prescriptive analytics along with visualization used for both data analysis and communication of results to stakeholders.
- Establishing a data-oriented mindset and culture that acts on data and uses analytics as a way to achieve measurable business success.

In addition, the program aims to a) provide skills needed to incorporate data correctly and effectively into business decisions and b) show the consequences of using, or not using, data to support decisions.

What the program does not do is offer a degree that could otherwise be offered by the statistics department. Furthermore, it does not require students to understand theoretical computer science and programming languages, nor does it require an understanding of advanced mathematics.
The degree consists of seven core courses, and three track-specific courses. The first course, Introduction to Business Analytics, is unique in that it provides a broad overview of business analytics and how they apply to decision making in various business functional areas. There are three courses covering business analytics techniques, a course in information management, and a course in visualization. The final core course will require a capstone project or an experiential learning activity. The courses will focus on a theme of problem-based learning as much as possible. This will involve the use of short scenarios to foster inquiry and generate questions, followed by the introduction of key data-based concepts, tools, and techniques that can be used to provide potential solutions. Potential tracks include workforce management, marketing, supply chain management, and information design.

Conclusion

The online Master of Science in Business Analytics is well supported by the school’s administration and faculty, and its implementation is a priority. The courses are being designed with a focus on interactive learning activities (both individual and group) rather than solely on readings and videos. The first courses are scheduled to launch in the summer of 2017.

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REFERENCES

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