Journal of the Midwest Association for Information Systems (JMWAIS)

Volume 1
Issue 1 *Volume 2015, Issue 1, January 2015*

Article 7

2015

A Reply to Hosack and Sagers "Applied Doctorates in IT: A Case for Designing Data Science Graduate Programs"

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Journal of the Midwest Association for Information Systems

Volume 2015 | Issue 1 Article 6

Date: 1-7-2015

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Abstract

This article presents a response to the argument presented by Hosack and Sagers (2015) in regards to the need and value for applied doctoral programs in Data Science. This response analyzes this proposition critically from the viewpoints of scope, doctoral program model, and program delivery.

Keywords: Applied doctorate in IT, Data Science Graduate Programs, Reply.

"This article presents the view and opinion of its author and does not represent the position of the JMWAIS Editorial Board or the position of the Midwest Association for Information Systems (MWAIS)."

1. A Reply and Response to Hosack and Sagers

The key proposition put forth in Hosack and Sagers (2015) is the need and value for new applied doctoral programs centered on "Data Science" (referred to as "applied doctoral programs" in this response). Their article builds its arguments by drawing a comparison with applied doctorate programs in other fields such as nursing and the lack of applied doctoral programs in data science and analytics. Further, in the section "Program Delivery Alternatives", the authors make an argument that the proposed applied doctoral programs would be distinct from traditional doctoral programs with its emphasis on applied research, analytics and problem solving. I believe I understand the rationale and logic of the proposition presented by the authors. However, as an Information Systems (IS) faculty member, I view this proposition with skepticism and concern for a few reasons, which I have detailed below.

First is the issue of scope. In my view, Information Systems (IS) is inherently an applied discipline where the majority of the research is focused on solving problems in varied domains (business, healthcare, criminology, and so forth). This applied nature leads to making IS research relevant to researchers and practitioners in the respective problem domain areas. In the process of making the research relevant, research rigor is also emphasized through application of kernel theories (behavioral or computational) that are either proposed by researchers in IS or based on theories from reference disciplines such as psychology, management, healthcare, criminology, computer science, statistics, and so forth. Certainly, debates have been ongoing by researchers in the field on topics such as balance of rigor and relevance (Beachboard, 2003) as well as the role of the IS discipline as a reference discipline (Grover, Gokhale, Lim, Coffey, & Ayyagari, 2006), which need to be acknowledged here. However, given these general ideas are widely accepted in the field, data science or analytics can be seen to fit squarely within the scope of IS as a discipline. This claim can be substantiated with numerous examples of applied research on analytics conducted by IS researchers and published by top IS journals (e.g., Chen, Chiang, & Storey (2012)). As such, the question becomes - why do we need a separate doctoral degree in data science if the various 'applied research' topics within this area can be effectively subsumed under the IS umbrella?

Second is the issue of the doctoral program model. The authors raise the need for emulating the European model of PhD or applied doctorates in the context of data science. The various Ph.D. models – namely the US model, the UK model, the Latin model, and the Scandinavian model are worth looking at in the context of this discussion (Avison & Pries-Heje, 2005). Based on these models, it appears that the authors are proposing doctoral programs in data science to be less focused on 'contribution', and 'academic career driver' dimensions, but more along 'courses and coursework' and 'applied project' dimensions. Based on this, consider the following key question. Why should candidates invest 3-4 years of their time in a doctoral degree when they can learn similar practical "applied" skills from a master's degree? Many of the analytics/data science Masters programs are indeed interdisciplinary in nature, as correctly pointed out by the authors. Further, consider the fact that in most of the traditional IS doctoral programs in the US model, core courses required by the masters and doctoral program in IS are the same or overlap to a great extent. Additionally, doctoral programs typically require methodology-focused courses, a minor in another area, and a few additional elective courses. Much of the emphasis is on research, particularly the dissertation process. If this model is compared to the proposed applied doctoral program in data science where the research component is deemphasized or removed, one wonders how such a program substantially differs from a Masters program? Indeed, most Masters programs in analytics or data science are interdisciplinary course-heavy and typically do not include thesis or research options, given the need for breadth and variety of topics and courses to be covered. Further, if "learning by doing" is the goal of the proposed applied doctoral programs, then it may very well be achieved with Masters programs coupled with relevant work experience on a variety of projects rather than investing several years on investigating one practical problem.

Third is the issue of program delivery. Hosack and Sagers make an argument in support of sponsorship from companies for full time students, and an alternative co-op model for working students taking the course part-time. While the authors provide tentative interest indication from companies regarding sponsorship, no substantial supporting data is provided. It is the norm that companies sponsor co-ops and internships. However, sponsorships on long-term (2 years or so) projects from companies are exceptions rather than the norm. The challenge is that of a sustainable model for program delivery. In regard to the co-op model for part-time students, a separate question is apparent. Part-time students completing the proposed doctoral program "more slowly" (as mentioned) would arguably need 7-8 years to complete the program. This seems unrealistic in a highly dynamic field such as IS where job requirements and skills have been changing every 3-4 years for the past two decades. Further, given the average low completion rates across the nation for doctoral programs, retention and graduation rate concerns for this type of model need serious considerations.

From an IS researcher and faculty standpoint, analytics/data science is a perfect topic stream that has emerged thanks to the technological advances and growth in wide variety of data sources. This is an opportune time for conducting relevant applied research within the IS field on these topics, given the strong base of design-science and managerial research approaches. From a skills gap perspective, Masters programs in analytics or data science (depending on the orientation) are being designed across the nation to serve the industry demand for skilled practitioners. To augment this, some doctoral programs in IS (e.g., doctoral program in IS at Dakota State University http://dsu.edu/graduate-students/dscis) have also proposed specializations or tracks focused on analytics, to cater to this topic area and for those interested in conducting applied research in this space. To summarize, in my view, data science/analytics is a key topic stream within IS that fits well within the scope of current Information Systems doctoral programs, and as such developing a separate applied doctoral program in data science is not warranted.

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