

Joint ACM/AIS Task Force to Evaluate the Need for a Revision of MSIS 2006: Model Curriculum and Guidelines for Graduate Degree Programs in Information Systems

Final Report and Recommendation

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A joint ACM/AIS Task Force was established in late 2012 to evaluate the need for a revision of the MSIS 2006 graduate curriculum recommendation for degree programs in Information Systems. The task force consists of two members nominated by ACM (Heikki Topi and Rolf Wigand) and two members nominated by AIS (Al Harris and Ramesh Venkataraman). Our work started with a face-to-face meeting at ICIS 2012, and it has continued actively virtually during Spring and Summer 2013. The charge of the task force was to make a recommendation to the ACM Education Board and AIS Council regarding the need to revise the MSIS 2006 curriculum. This document presents a summary of the analysis conducted by the Task Force and its final recommendation.

The Task Force has collected data regarding the context and use of MSIS 2006 using four different approaches:

- A survey sent to about 100 MSIS program directors in the U.S
- A request for unstructured feedback sent to the AISWorld mailing list
- A structured benchmark analysis of MSIS 2006 compared to 26 leading US-based MS programs in Information Systems
- A structured benchmark analysis of MSIS 2006 compared to 12 non-US MS programs in Information Systems

Based on the analysis of the data we collected throughout the review process, we offer the following findings and observations:

Survey of Directors of U.S. based MSIS and Similar Programs (n = 17)

A survey of directors of 100 U.S.-based Master's degree programs in information systems and closely related fields was administered in March and April 2013, including two rounds of reminders. The 17% response rate is relatively low, but not unusual for these types of surveys. The call for survey responses and follow-up requests were sent to individually verified e-mail addresses of the program directors. The key observations related to this survey are as follows:

- 65% of the respondents indicated that MSIS 2006 would need a comprehensive revision. Another 25% suggested that a minor revision is needed. Thus, 90% of the respondents agreed with the need to revise MSIS 2006.

- 70% of the respondents either agreed or strongly agreed with the statement “I found MSIS 2006 to be a valuable resource in our curriculum development work.”
- 47% of the respondents indicated that their universities either had already launched or were planning to launch a master’s degree in business analytics, data analytics, data science or a similar field. None of these programs had, however, replaced a traditional MS in Information Systems.
- The topic areas that program directors wanted to emphasize as important in a possible curriculum revision included: data/information security, cloud computing, data analytics, and managing the globally distributed IT supply chain. In addition, the comments focused on the continued importance of finding a good balance between technical skills, foundational professional skills (such as collaboration, communication, and critical thinking), and domain knowledge. Finally, several respondents indicated that the technical content of MSIS 2006 needs to be updated.
- Project management, systems analysis and design, data management, and business process modeling were identified as graduate capabilities that continue to be important.
- The most important target positions for MSIS graduates are business analyst, consultant, systems analyst, network administrator, and database administrator. This informs about the broad variety of the programs and the capabilities they help the graduates to gain.

General Request for Feedback (n = 32)

The Task Force sent a call for feedback to the subscribers of the AISWorld Listserv in April 2013. A follow-up call was sent about a month later.

- More than 90% of the respondents (29) indicated that they either agreed or strongly agreed with the statement “AIS and ACM should launch a process to revise MSIS 2006”.
- The number of qualitative comments was too small for identification of clear trends. Some of the key observations made in the survey include, however, the following:
 - Model curricula are very useful in communicating with upper administration.
 - Career tracks and flexibility continue to be important. A revised MSIS curriculum recommendation should provide clearly separated options for more technical and more managerial programs. Also, the curriculum should allow easy and flexible creation of derivative programs.
 - Important topic areas include business analytics, big data (data science), in-memory processing, security, and mobile computing from business and technical perspectives.
 - The curriculum should pay more attention to the societal and ethical implications of IS decisions.

Benchmark Comparison Between MSIS 2006 and U.S.-based MS Programs

The Task Force performed an in-depth analysis of the curriculum of 26 of U.S.-based master's degree programs in information systems and closely related fields. The sample was selected by the Task Force to represent highly respected, leading programs. The review was based on the material the programs have made available on their websites.

The key facts discovered in the comparison were as follows:

- The curricula of the programs vary very significantly. See below for details in three categories of required courses: IS Technology, IS Management, and Business (or other domain). Overall, the two common topic areas/courses that almost all programs share are data management and systems analysis and design.
- **IS Technology**
 - The number of required core courses related to IS Technology varied from 1 to 9, with a median value of 4 and average 4.6.
 - The only topics that almost all share as a required course are data management (22 out of 26 programs) and systems analysis and design (17 out of 26 programs). This is particularly interesting given that MSIS 2006 does not include a separate data management course.
 - 12 out of 26 programs include some type of a required programming/application development course. This course is a prerequisite in MSIS 2006.
 - A business intelligence/analytics course starts to be a relatively typical but not yet dominant part of the core of the programs (nine out of 26).
 - Security and enterprise architecture are only sporadically present as course-level topics.
- **IS Management**
 - The number of required core courses related to IS Management varied from 0 to 7, with a median value of 2 and average of 2.2.
 - The most common IS Management courses are IT Project Management (11), Management of the IS/IT function (11), and IT/IS strategy (9). Project management and IS strategy are included in MSIS 2006; Management of the IS/IT function is not.
 - Governance frameworks and assurance/control issues have a visible presence only in few programs. There were very few courses on innovation included in the programs.
- **Business or other domain**
 - Nine out of 26 programs have no required business (or other domain) content.

- The number of required core courses related to Business or other domain varied from 0 to 10, with a median value of 1 and average of 3.0.
- The most typically required core courses were Accounting (9), Finance (9), Organizational Behavior (8), and Mathematics/Quantitative Analysis (7). Finance and Mathematics/Quantitative Analysis are not included in MSIS 2006.
- **Career Tracks**
 - Business intelligence/analytics was the most common career track (8) followed by security/assurance (7), data management (3) and (application) development (3).

Benchmark Comparison Between MSIS 2006 and non-U.S. Programs

The Task Force performed an analysis of 12 non-U.S. programs. Given the rich variety of the educational contexts in which the programs are offered, any true comparison analysis was very difficult. Based on this analysis, we can make the following observations:

- The curricula of these programs vary even more than the U.S. programs, if possible.
- The most common shared required technical course is Systems Analysis and Design (7) followed by Information Management (5), Application Development (5), and Business Intelligence/Analytics (4).
- The only required managerial course that was commonly shared by the programs was IT Strategy (6).
- Very few programs offered U.S. style core business courses.
- Tracks were less common than in the U.S.
- Almost all programs had a significant (at least a semester-long) thesis component.

General Conclusions

Based on the surveys and the program comparison analyses, the Task Force would like to present the following observations:

- Those program directors and other members of the IS community who provided feedback to the committee indicated overwhelmingly that there is a need to review and revise MSIS 2006.
- Members of the IS community have found MSIS 2006 to be a useful resource, indicating that future revisions of the model curriculum would be likely to serve in a similar way.
- There are several significant differences between the current practice in the leading programs and MSIS 2006. This does not, of course, automatically mean that the model curriculum should be updated but it appears that at least the following concerns and issues are worth considering:

- Given the dominant role of the data management course in leading programs, it is important to at least ask the question whether or not it should be included in the core recommendation as a separate course, instead of being included currently.
- Business intelligence/analytics in various forms is present in 40% of the leading programs, and anecdotal evidence suggests that its role is becoming increasingly important. Therefore, it is another strong candidate for inclusion in the recommended core curriculum.
- 45% of the programs have a course in Management of the IS/IT function (or a related topic); this material is currently included in the MSIS 2006 core as part of the integrated capstone, but it is possible that it would deserve a more visible role.
- Business intelligence and analytics is also the most common of the career tracks offered by the leading programs. This particular track is not included in the list of the 24 tracks in MSIS 2006 (although Data Warehousing and Data Mining and Decision Making are related). In general, the MSIS 2006 career tracks should be reviewed, and it is possible that a revision should provide more detailed career track guidance to fewer career tracks.
- There appear to be two main types of programs: those with a general IS management focus with less (but some) emphasis on technology and those with a broader IT focus with less emphasis on IS management. It is worth asking whether or not this should be formally recognized in the curriculum recommendation.
- Based on both the curriculum analysis and surveys, there are both potential core topics and career tracks that have a small role both in the benchmark analysis and in MSIS 2006 but that are potentially very important already now and moving forward, such as:
 - Big data analytics / data science
 - Cloud computing and virtualization
 - IS controls and management frameworks
 - Social media.
- The rich variety of the programs and the lack of the intellectual core is a concern from the perspective of the field. It is very difficult for MS programs in IS to achieve their full promise if prospective employers and other key stakeholders do not have a clear idea of the identity of the programs. A revision of the MSIS model curriculum could serve a role in moving closer to this type of shared identity.

In addition to the work of this Task Force, there have been other efforts within the IS community that have made a strong conceptual case for the need to revise MSIS 2006 (including Topi et al., 2011 and Topi et al., 2013). We will not repeat those arguments here but refer to them as additional supporting material.

Based on its research and analysis summarized above, **the Joint ACM/AIS Task Force respectfully recommends that both organizations make a decision to**

launch a joint process that will lead to a comprehensive revision of MSIS 2006.

As typical in these processes, the work should be led by two co-chairs (one from each organization) and a broadly representative steering committee, the size and composition of which will depend on the resource commitment the organizations can make. The steering committee should be able to meet at least three times face-to-face.

In fall 2013, the organizations should discuss and agree on the resources they are able to allocate for this purpose and the structure of the steering committee with the goal of launching the process in Spring 2014 and the main bulk of the work taking place in 2014-2016, leading to the publication of the revised curriculum recommendation in 2016.

Final Remarks

We are pleased to answer any questions you might have and provide access to the detailed data that we collected, if necessary. We thank for the opportunity to serve as members of the Preliminary Review Task Force!

References

Topi, H, M Helfert, V Ramesh, and R T Wigand. 2011. "Future of Master's Level Education in Information Systems." *Communications of the AIS* 28 (Article 27).

Topi, H, K Conboy, B Donnellan, V Ramesh, C Van Toorn, and R T Wright. 2013. "Moving Towards the Next Generation of Graduate Degree Programs in Information Systems." Working paper under review at *Communications of the AIS*.