31 October 2018

TO: Sarah Mangelsdorf, Provost
FROM: John Karl Scholz, Dean
RE: Notice of Intent to Offer: Master of Science – Information
CC: Greg Downey, Associate Dean for Social Science, L&S
Marty Gustafson, Assistant Dean, Continuing Studies
K.-Sun Kim, Professor and Interim Director, iSchool
Elaine Klein, Associate Dean for Academic Planning, L&S
Shirin Malekpour, Associate Dean for Teaching and Learning Administration, L&S
Jocelyn Milner, Vice Provost and Director, Academic Planning and Institutional Research
James Montgomery, Associate Dean for Fiscal Initiatives, L&S
Jennifer Noyes, Associate Dean for Operations and Staff
Parmesh Ramanathan, Associate Dean, Graduate School
Emily Reynolds, Academic Planning Specialist, Graduate School
Nicole Wiessinger, Academic Planner, Academic Planning and Institutional Research
Eric Wilcots, Deputy Dean, L&S

On September 18, 2018, the L&S Academic Planning Council considered the attached request from the Information School (a department in the College of Letters & Science), to create a new graduate program, Master of Science - Information. This non-pooled tuition program is aimed at adult student career changers, and those seeking an entryway into a data, information, or computing profession without a relevant bachelor’s degree. The degree would offer concentrations in data management and governance in organizational settings, user experience and interaction design, and data analytics for decision-making. This program would be offered in two different formats, each having the same requirements but involving the creation of different named options: The “Campus Option,” designed to be completed in an accelerated face-to-face format, and the “Online Option,” available as a part-time online format.

The proposal lays out the case for change and provides comparisons to programs offered by peer institutions. The faculty have consulted with current and former students, with related units within L&S, and with outside academic and professional stakeholders in the course of designing
this program. Market research supports the importance of having a program that complements the existing accredited Master of Library and Information Studies, but which is designed to more flexibly address the needs of professionals who are not seeking and who do not need the MLIS credential. The accredited Master of Arts in Library and Information Studies will not change; that program will continue to train students and scholars in work associated with libraries, archives, and other information agencies.

The L&S APC unanimously approved this proposal, which I forward to you with my enthusiastic endorsement. If you have questions, please feel free to contact me, Professor Eschenfelder, or Associate Dean Greg Downey.
Notice of Intent – MS in Information  
The Information School  
University of Wisconsin-Madison  
August 18 2018  
Contact: Kristin Eschenfelder eschenfelder@wisc.edu or Michele Besant michele.besant@wisc.edu

a. Specify the name of proposed degree/major, departmental or unit home, school/college. Specify the mode of delivery. If the program has an academic home that is not a regular academic department, then also describe how the program will be governed.

The Information School (the iSchool), in the College of Letters and Sciences at the University of Wisconsin-Madison, proposes a new revenue-generating 131 MS in Information.\(^1\) The program will be governed and managed by the faculty of the Information School. The 30 credit program will be offered in two modes (1) an accelerated face-to-face format, and (2) a part-time online format. The two modes will be administered through two separate named options: MS Information accelerated campus option and MS Information part time online option. The two named options will have the same curricular requirements.

The degree is aimed at adult student career changers, and those seeking an entryway into a data/information/computing profession without a relevant bachelor’s degree. This target market fits well with marketing data that suggest the degree is best suited for those without an existing related bachelor’s degree in computing (see Burning Glass reports from 2007 and 2008 in appendix). Further, the iSchool has successfully served this audience with our existing degrees.

The program will be managed by, and governed by the iSchool, and students will be able to complete the degree through taking only iSchool courses. However, in order to take advantage of the strengths of the UW-Madison campus, the program plans to include other courses via curricular partnerships with the Department of Computer Science and the School of Business. These partnerships will provide partner units the opportunity to garner revenue by offering courses to the MS Information students. All partnerships would be governed by L&S approved MOAs between the Information School and partner departments, and they would use the standard L&S revenue transfer model for shared revenue courses.

The proposed degree would immediately have the following three concentration areas. More would be added as faculty are expanded through program revenue:

Area 1: Data and information management/data governance in organizational settings (iSchool courses only)  
Area 2: User experience and interaction design (courses already fielded for capstone UX certificate in coordination with Computer Science)  
Area 3: Data analytics for decision making (iSchool courses only)

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\(^1\) The degree name of MS in Information is currently fashionable in the field and is used by peers such as University of Michigan, University of Arizona and University of Washington. An alternative degree name would be an MS in Information Science, which is also common, for example it is currently used at University of Illinois.
Areas 2 and 3 stem from existing iSchool capstone certificates already managed by the iSchool: the capstone certificate in Digital User Experience Design (area 2), and the capstone certificate in Data Analytics for Decision Making (area 3). All courses for these areas are in the catalog.

The iSchool has many existing courses for area 1, but is also in the process of seeking approval for new four additional courses:

- Digital Privacy, Safety and Security (run as a topics in summer 2018 and scheduled for spring 2019)
- Systems Analysis & Project Management for Information Professionals (run for several years as a topics class)
- Managing Data and Information in Organizations (new course)
- Data Science Ethics (course being planned in conjunction with Statistics MS Data Science and planned L&S undergraduate degree in Data Science)

In addition, in the future, the proposed MS Information degree hopes to offer two additional concentration areas with the School of Business:

- advanced decision analytics (with additional advanced analytics courses offered in the School of Business)
- data risk, safety and surveillance (with additional data risk and security management courses offered in cooperation with the School of Business)

b. Provide a clear and focused explanation of how the proposed program fits with the institutional mission, the University's strategic directions, and the program array. In other words, why is this program an important offering for UW-Madison?

The proposed revenue generating program fits well within current campus strategic plans to develop additional revenue generating professional master’s degrees. The proposed program will help develop a data and information savvy workforce for the state of Wisconsin.

The proposed program is complementary to the Information School’s long standing Masters of Arts degree in Library and Information Studies. The MS degree will share some electives courses with the MA, but it will differ in requirements, learning outcomes and required credit hours. The primary aim of the existing MA is to produce library and archives professionals and it is accredited by the American Library Association (ALA) Committee on Accreditation. We will not seek ALA accreditation for the proposed degree. The new degree will aim to produce information and data professionals who work in corporations, startups, nonprofits and government organizations.

The proposed MS in Information is designed to work in conjunction with the existing iSchool housed capstone certificate in User Experience Design (10 credits) and the capstone certificate in Analytics for Decision Making (9 credits). Admitted students who previously earned credits in the capstone certificates can transfer their credits into the MS in Information within 5 years of completion of the original credits. Students admitted into the MS in Information will be eligible to share coursework with students in the capstone certificates. Mixed enrollments within a course will be managed using section-level restrictions.
The proposed program is complementary to two existing programs on the UW-Madison campus: (a) the professional masters in Computer Sciences, and (b) the MS-Statistics Data Science option. In addition, this document will address the MS Information relationship to two future campus programs, the (c) masters of Enterprise Information Systems Management at the School of Business, and a (d) proposed collaborative degree housed in Engineering tentatively titled MS in Design Innovation.

Existing UW-Madison Campus Degrees:

**Computer Sciences Professional Masters:** The proposed MS in Information differs from the Computer Sciences Professional Masters (PMP) in that it would include more coursework in the areas of management, communications, policy/ethics, human information/data behavior and social impacts of organizational and societal use of data for decision making purposes. The MS in CS assumes students have a higher level of technical proficiency prior to admission, take a greater concentration of technical courses, and take more advanced technical courses. The technical coursework for the MS in Information would include more entry-level technology courses than the CS PMP; for example, the iSchool would count entry-level programming courses toward the MS Information degree, while the CS PMP would not. The program also differs from the CS PMP in the coursework that will be available online and thus the program will draw a different set of students. The CS PMP is more purely technical in nature and prepares students for jobs that require a high level of knowledge of computer hardware, programming and computational theories (e.g., programmer, software developer).

The MS in Information will partner with CS to field courses for the human computer interaction concentration. The degree may ultimately include a named option in “human computer interaction” that could include CS coursework through a revenue sharing arrangement (if space is available).

**Statistics – MS Data Science Option:** The proposed MS Information differs from the MS Statistics Data Science option in that the Statistics MS has a much stronger statistical and computational perspective. The MS Data Science has numerous math and statistics prerequisites, while the MS Information has none. The MS Data Science will produce data scientists while the MS Information aims to produce data savvy information professionals.

The MS Information approaches data management from a much more managerial, policy and social impacts perspective. The MS Information degree would focus on issues related to planning data management at an organizational level, data organization and access issues, auditing and evaluation of data practices, and data policy and ethics issues and would cover only introductory statistical and data mining concepts to support creating data-savvy managers.

Statistics has already approved the three Information School courses that would compromise the statistical component of courses possible in the MS Information and has included a letter of no objection. The two programs plan to share a future iSchool’s course in Data Science Ethics.

Proposed UW-Madison Degrees
**Business School/Enterprise Information System Management:** The UW-Madison Business School and the iSchool are planning a shared curriculum for a Business School housed campus-based 131 master’s degree in Enterprise Information Systems Management (EISM). The EISM degree will aim to produce students to work for global IT/data analytics consulting firms and may have prior business coursework. The planned EISM degree may have concentrations in Enterprise Systems, Advanced Analytics for Decision Making, and Data Risk, Safety and Surveillance. The iSchool will coordinate with the School of Business and may offer iSchool coursework in the Analytics and Data Risk and Surveillance areas. The School of Business has signed a letter of support for the MS in Information.

The MS Information will differ from planned Business School degrees in that it will:
- offer an online degree option,
- include information science concepts not covered by Business School courses,
- include information ethics and values concepts not covered by Business School courses,
- prepare students for careers in the nonprofit and public service sectors rather than for careers in global IT consulting, and
- not include concentrations in the areas covered by School of Business.

**Engineering/Design Innovation:** The iSchool is part of a committee planning a one year accelerated MS Design Innovation that will be housed in, and managed by, the College of Engineering. Other partners include Design Studies in the School of Human Ecology and the School of Business. The MS Design Innovation will offer a user experience design option through the 10 credits of iSchool user experience design coursework. Also, students completing the iSchool’s UX certificate could choose to transfer those credits into the MS Design Innovation.

The MS Information will differ from planned MS Design Innovation degrees in that it will:
- offer an online option,
- offer part time options for working adults,
- include concentrations not covered by the MS Design Innovation (information and data management/data governance, analytics for decision making)
- include information/data ethics and values concepts not covered by the MS Design Innovation, and
- prepare students for careers in managing data and information rather than careers in design. The MS Design Innovation is very focused on careers in design: design engineers, design entrepreneurs, business model and supply chain designers

**c. What is the need for the program, in the context of existing programs at UW-Madison and System-wide? Include accurate information on programs at other UWs. Include data on student demand and market demand for graduates. If this is an emerging field, explain how it will be important in the future.**

The admissions team at the iSchool reports a high level of interest in this degree from perspective students. We already have future applicants on stand-by waiting for the proposed program to move forward.
Three related programs exist in the UW System:

- **The UW-Milwaukee MS Information Science and Technology (36 credits).** The proposed iSchool MS in Information differs in three ways from the UW-Milwaukee program and will attract a different audience of students:
  1. The Milwaukee MS is currently offered “primarily online” according to the program website. In contrast, the MS Information will offer a campus-only named option we will recruit a sizable international student cohort.
  2. The proposed iSchool program has a unique affiliation with two existing capstone certificates in User Experience Design and Analytics for Decision Making. This relationship gives students in the online named option or the campus named option the flexibility of beginning their graduate work with an online certificate and then rolling the credits into the MS degree.
  3. The UW-Madison proposed degree differs in that it requires a for-credit field experience while the Milwaukee degree does not.
- **Data Science (UW-System Collaborative Degree 30 credits)** – The MS Information has a different mission than the UW System Data Science degree and will attract a different population of students. The MS Information contains an Analytics for Decision Making concentration area, but its goal is to create data savvy information managers, while the Data Science MS aims to create data scientists or statisticians. Compared to the UW System Data Science MS, the MS Information will provide more entry level, applied knowledge of data analysis, data visualization, data management, data governance framed within the context of practical organizational decision making and information management. It will not have the mathematics and computer programming prerequisites required by the Data Science program.
- **MS Information and Communications Technologies (Stout 30 credits)** The proposed iSchool MS in Information differs in five ways from the UW-Stout program and will attract a different audience of students:
  1. The UW-Stout program is also 100% online, not facilitating enrollment by those preferring face to face instruction and international students. In contrast, the MS Information will offer a campus-only named option we will recruit a sizable international student cohort.
  2. The proposed iSchool program has a unique affiliation with two existing capstone certificates in User Experience Design and Analytics for Decision Making. This relationship gives students in the online named option or the campus named option the flexibility of beginning their graduate work with an online certificate and then rolling the credits into the MS degree.
  3. The UW-Madison proposed degree differs in that it requires a for-credit field experience while the Stout degree does not.
  4. The program concentration areas of the Stout program area different. The UW-Madison concentration areas include: Data and information management/data governance in organizational settings, human computer interaction/user experience design, and data analytics for decision making. Stout’s concentration

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2 The program explains that “due to the online course offerings, students are not able to meet J1 or F1 visa requirements for study in the US.”
areas include: computer networking and network security, digital marketing technology, enterprise technology (e-commerce), learning technologies.

5. The Stout program requires two years of relevant experience for admission. The UW-Madison program will not require any relevant experience for admission, making the program more accessible to students without any prior information technology background.

Expected demand for related jobs in the upper Midwest:

Division of Continuing Studies (DCS) facilitated a Burning Glass Insight Job Posting Analysis for the MS Information in June of 2018 and overall reports that the MS Information had a high number of relevant job postings (see appendix) with the highest demand on the west and east coasts, but with good demand in the Midwest including Michigan, Minnesota, Illinois, Ohio and also Wisconsin.

Figure 1: Job Ads related to MS Information: Dark = more job ads posted)

Source: Burning Glass Job Posting Report from DCS

Below we provide more information on each of the planned concentration areas of the MS Information and target employment categories for each area:

**Human Computer Interaction/UX:** While HCI and User Experience Design are not categories in the Bureau of Labor Statistics Occupational Handbook, similar job titles that require a mix of IT skills with strong understandings of human behavior, organizational factors and design, have above average projected job growth (e.g., Web Designer 27% growth, Systems Analysts 21% growth). The 2018 Burning Glass report suggest 18.8% job growth for software developers (related to UX) and 20.9% growth for computer systems analysts. A 2017 Educational Advisory Board consulting report obtained via Division of Continuing Studies suggests students with this concentration can obtain employment with titles like “User Interface Designer” “Interaction Designer” “Computer Systems Analyst” and those students taking more courses in partnership with Computer Science could obtain jobs as “Software Developers.” The User Experience Professionals Association (UXPA) 2016 jobs survey found average national salaries of $98,000 with average starting salaries of just over $60,000.
Data Analytics: An Educational Advisory Board consulting report obtained via Continuing Studies found that occupations related to analytics and data analysis are expected to grow faster than the average of all occupations in the United States. For example, market research analysis positions are expected to increase by 32% by 2022. Bureau of Labor Statistics reports that Management Analyst positions will rise by 9%. DCS interviews with employers emphasized the need for employees with applied research skills such as "using statistics in a business setting" and "understanding if data are credible" and data communications skills such as information visualization and how to "persuade and influence" using data. Indeed.com reports the average salary for a data analyst nationally as $69,653.

Data/Information Management, Data Governance: This concentration aims to create specialists in managing large amounts of data, and processing and manipulating that data to make organizational decisions and generate new products and services. Other terms associated with this concentration include knowledge management and information/data security and data governance. This is a new employment area that is not well represented by traditional employment categories, but organizations of all types increasingly rely on effective storage and retrieval of data and information to make decisions. BLS does not list data management or governance as a tracked job, but Glassdoor lists related job titles such as “chief data officer, data management, enterprise data architect, data modeler, database marketing, business analyst, data analyst, data architect” working primarily in health care, insurance, and the financial industries. Indeed.com reports an average salary for data analysts of $69,000. Data architects, a position requiring more database skills that the MS Information would provide, earn an average of $122,000.

Information Science: The information science concentration creates specialists in the computational processing of textual information through tools such as text and web mining, textual data visualization, natural language processing and basic machine learning. This is an employment area that is not well represented by traditional employment categories, but organizations of many types need text mining skills. Graduates could work in the technology and analysis units of organizations that seek to identify and explore patterns in and among texts. Many software companies, government agencies and research organizations seek experts who can develop and run analysis to discover relationships between texts, automatically detect text topics, text parts or text subjectivity, automatically product synthesis of large texts, and generate network analysis of relationships between texts.

Data Risk, Safety and Surveillance: Educational Advisory Board consulting reports show high demand for master’s level job postings in information and data security both regionally and nationally. The proposed collaboration with the Business School would not contain the advanced technical coursework needed to qualify as a “Cybersecurity” MS, but it would produce information professionals who are literate about computer security issues and have expertise in the human factors, data/information governance and policy/legal aspects of information/data security and these skills are in high demand. Technology companies, higher educational institutions, government agencies, NGOs are currently dealing with policy and ethical issues related to collection and use of information and data beyond merely securing data they already have. The 2018 Burning Glass report suggests a 20.9% growth in positions of “information
security analysts.” We anticipate producing students who can address these broader concerns. The Information School has a strategic partnership with the UW-Madison Cybersecurity Office to facilitate student internships in the areas of analysis/assessment, monitoring, policy development and training/communications. These internships will provide a unique opportunity for campus students pursuing this area of study.

d. Provide a brief description of the program. All of the curricular details do not need to be worked out at this stage but a general outline of what is intended is helpful.

MS Information program level learning outcomes include:

- Students apply data, information technologies, and an understanding of human behavior to solve organizational, community or social problems.
- Students demonstrate understanding of legal, policy and ethical issues related to data and information.
- Students apply principles of information science to organizational data and information management challenges.
- Students apply quantitative methodologies and data visualization tools to improve decision making.
- Students demonstrate professional communications and teamwork skills and capacities to use collaborative technologies.

The 30 credit program will be offered in two modes via two named options:
(1) a full-time face-to-face format that could be completed in 3 semesters and a summer (campus named option)
(2) a part-time online format which can be completed in approximately 3 years (online named option)

The degree requirements for the two named options are the same:

The program (both named options) would require 21 credits and have 9 credits of electives.
- 18 credits breadth requirements (6 credits * 3 core areas) (required)
- 3 credit practicum/internship requirement (required)
- 9 elective credits to specialize.

Breadth Area 1: People (6 credits)
Data Ethics (3 credits)
Management (3 credits)

Breadth Area 2: Systems (6 credits)
Systems Analysis and Project Management (3 credits)
Relational Database Design for Information Professionals (3 credits)

Breadth Area 3: Analytics (6 credits)
Introductory Analytics for Decision Making (3 credits)
Data Visualization and Communications for Information Professionals (3 credits)

3 credit internship/practicum required

9 credits of electives for concentrations
Students will have 4 initial pathways for concentrations. All specializations could be completed with iSchool coursework, but some concentrations would also include options to take courses in other campus units when available.

- Path 1: User experience design/human computer interaction using UX capstone certificate coursework and in collaboration with Computer Science.
- Path 2: Advanced data analytics using additional Analytics capstone certificate coursework or advanced Business school coursework.
- Path 3: Organizational data/information management and governance using other iSchool electives or advanced analytics courses from the School of Business.
- Path 4: Mixed – Students create a custom program in consultation with their advisor.

Additional specialization areas will be added as faculty are hired.

Program will assess achievement of learning outcomes through a required e-portfolio that will be reviewed and scored by the faculty.

e. Describe the resources requirements of the program. If it will be supported from reallocation or existing resources, provide a summary explanation. If unusual resources, such as program revenue, will support this program provide a description and summary business plan. (The vice chancellor for administration will review the proposal before it is advanced to the UAPC and will approve any resource considerations).

The program will be supported through program revenue. The iSchool plans to hire additional faculty to support the program through revenue.

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<th>Planning Phase</th>
<th>Launch and Grow</th>
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<td>Credits Taught</td>
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Business Plan Summary:
We are requesting a market based tuition of $1200 per credit for both the campus delivered named option and the online delivered named option.

Planned tuition: $1200 per credit (nonstandard)
Planned target enrollment: 100 students per year enrolled and actively taking courses (75 part time at 10 credits a year, 25 accelerated full time at 30 credits a year)

Estimated Paid Tuition: $1,800,000 per year

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Minus 32% campus surcharge = $576,000
Revenue to program = $1,224,000

-$787,582 Annual Direct Student Support Costs
Includes costs for: planned faculty and instructional staff hires (i.e., salary + fringe), student services, administrative services, planned seat payment to partner departments under L&S revenue transfer model, marketing, scholarships

Net revenue after all instructional and management costs: $400,477.

A 5 year planning budget has been provided to L&S.

f. Provide a list of the program faculty who are central to the planning process and who will participate in the program when it is implemented. For graduate programs that will include a thesis or major project, this list should include faculty who are likely to be major professors in the new program.

Key Program Faculty:
Kristin Eschenfelder, Professor Information School
Kyung Sun Kim, Professor Information School (interim Director 2018-2019)
Catherine Arnott Smith, Professor Information School
Alan Rubel, Associate Professor Information School and Legal Studies
Reginold Royston, Assistant Professor Information School and African Cultural Studies
Dorothea Salo, Faculty Associate, Information School
Bronwen Masemann, Faculty Associate, Information School
Computer Science UX/HCI Partnership: Bilge Mutlu, Associate Professor Computer Science
Future Business School Partnership: Susanna Dove, Ella Mae Matsumura, Anne Massey

g. Attach letters of support or concurrence from departments, schools, and colleges that are contributing courses to the program; units that will have an interest in the program; or units that may offer existing programs that potentially overlap with the proposed program in name or content. It is especially important to include letters from units outside the home school/college.
Computer Sciences, School of Business, Statistics
September 7, 2018

Prof. Kristin Eschenfelder  
Director, The Information School

This letter is regarding your request for a letter of “No objection” to the proposed MS in Information that the iSchool is planning to create.

At a faculty meeting on Tuesday, September 4, the Computer Sciences department faculty passed the following motion:

“Provide the iSchool with a letter of "no objection" to create a master's in Information Science.”

The vote was 23 in favor, 0 opposed, with 2 abstentions.

Sincerely,

Gurindar S. Sohi  
Department Chair  
Vilas Research Professor
MEMORANDUM

Date: March 19, 2018

To: Elaine Klein, Associate Dean for Academic Planning, College of Letters and Sciences

From: Barry Gerhart, Interim Albert O. Nicholas Dean, Wisconsin School of Business

Re: Proposal for MS in Information by the School of Information

The Wisconsin School of Business Academic Planning Council has no objection to the proposal for an MS in Information by the School of Information in the College of Letters and Sciences.

Copies:
Kristin Eschenfelder, Director, School of Information
Ella Mae Matsumura, Senior Associate Dean of Academic Programs
Dear Kristin,

I am writing on behalf of the Department of Statistics to support the proposal for an MS in Information by the School of Information. We understand that the new degree will include introductory data analytics courses that Statistics has already approved as part of the Capstone Certificate in Data Analytics for Decision Making. The proposed program is likely to attract students from a different population than our existing MS program, and so will not compete for a limited resource. In fact, we see potential synergies where courses in each program may be used as electives to add value to the other program and add opportunities to add breadth to the educational experience of students in both programs. In particular, the proposed course on Data & Algorithms: Ethics and Policy would help to address an element missing from our existing and proposed degree programs in data science.

Sincerely,
Yazhen Wang
Professor and Chair
Department of Statistics
University of Wisconsin-Madison
Email: yzwang@stat.wisc.edu