# Review of the Information Systems Programs

## (AS WebDev, BS CIS, MSIS, and Ph.D. IS)

**College of Business and Information Systems**
**Dakota State University**

On-Site Visit May 1-3, 2019

**External Review**

**By**

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<p align="center">**Information Systems Programs**</p>

<p align="center">**Dakota State University**</p>

<p align="center">**External Academic Program Review Report**</p>

## Part 1: Executive Summary Findings

The Information Systems (IS) program within the College of Business and Information Systems at Dakota State University consists of four main programs: (1) Associate of Science in Web Development (AS WebDev), (2) Bachelor of Science in Computer Information Systems (BS CIS), (3) Master of Science in Information Systems (MSIS), and (4) Doctor of Philosophy in Information Systems (Ph.D. IS). The AS WebDev is a new program with very small enrollment numbers but has excellent potential to become a feeder for the BS CIS program. The Ph.D., in its current form, is also a new program, which is recently changed from D.Sc. to a more prevalent and recognized Ph.D. formation. All four IS programs seem to be closely following the rapidly and continuously changing IS educational trends, having up to date and state of the art curriculum, degrees, and specializations. The reputation of these programs is built by the IS faculty through their long-term unwavering dedication to the educational mission and vision of the college, and it was among the first colleges within the regional public universities to develop highly successful online educational programs in Information Systems. Overall, the external reviewer was very impressed with what has been established, continuously improved, and mostly accomplished with all four IS programs: AS WebDev, BS CIS, MSIS, and Ph.D. levels.

As is the case in most institutions, the IS programs may benefit from some changes and improvements to continue to excel in its endeavor and alleviate some potential problems. The most obvious problem seems to be the low enrollments in the undergraduate programs, which

needs to be significantly increased. A more diligent publicity/advertising and awareness building program can elevate this situation. Such a program can target not only the potential students at the nearby high schools but also the parents and high school administrators and student education/career advisors. In addition to the external constituents (i.e., regional high schools and community colleges), a purposeful awareness-building initiative should be targeted to student adviser within the university. Based on the discussion with a variety of stakeholders (students, professors, administrators, and support personnel), the external reviewer thinks that the outstanding success of the cyber school (the Beacom College of Computer and Cyber Sciences and its program offerings) is overshadowing the recognition of the IS programs at both undergraduate and graduate levels, but especially at the undergraduate levels. It looks like the incoming students with computer information systems interests are being directed to the cyber school by the university advisors without much consideration of their desires that fit better with the IS programs (AS Web Dev and BS CIS). Having a dominant and highly reputed presence at the university (enjoying roughly half of the university's total student enrollment) makes the cyber school a natural default destination to advise for all computer and information systems enthusiast incoming student. It is the responsibility of the college and the IS program administrators, directors, and faculty to educate the advisors about IS programs, their differences from the cyber school offerings, and thereby, receiving their share of students genuinely interested in management information systems and not in cybersecurity and/or computer science.

Because of the recent industrial developments in the geographic region, there is an excellent opportunity to create a unique niche for the IS programs in banking and financial services as well as in healthcare and medical services. These two industry segments are constantly seeking information technology graduates with skills and in-depth education in the

latest information systems trends. Initiating and nurturing close relationships with these industries can help in purposeful curriculum development, which would lead to a multitude of mutual benefits that include better recruitment, internship, employment, guest speaking, academy-industry collaborative research and development projects, and other tangible/intangible benefits to the business school in general and IS programs in specific.

Although DSU is primarily a teaching school, because of its growing interests and initiatives in graduate programs, the research component needs to be improved, especially for the graduate-level IS program. This can be accomplished through increasing grant activity and by publishing in top tier academic journals. Working with the faculty at the cyber school, most of whom were part of the business school until the separation of the cyber school as a new college just a few years ago, identifying and pursuing regional and national funding opportunities, and collaborative publication potentials are just a couple of sure ways to build a successful research program. These types of initiatives are very important for the long-term reputation and viability of the IS graduate programs, and in particular, the IS doctoral program. One way to accomplish this is through some fundamental changes in the incentive system for research activities, which may include course releases, financial incentives, and academic promotions. These practices would eventually shift the school from primarily a teaching culture to a more balanced teaching and research culture, which according to the external reviewer's understanding from the interviews, seems to be the desire of the university leadership (the upper administration).

The IS program in the business school provides intellectual and service leadership in the profession, and its faculty holds visible positions in academic societies, journal editorial boards, and conference organizing committees. The IS program has enriched the intellectual capital of the field by producing internationally-visible academic programs as well as enrolling a large

number of doctoral students. A number of the department's faculty members are to be considered among the up and coming researchers based on their publications in IS journals. The department has hired some very promising IS junior faculty members to further bolster the quality of their faculty. The department offers very successful undergraduate, graduate, and doctoral IS degree programs along with vibrant IS coursework/curriculum for all degrees. The department continues to innovate and has continued to emphasize an online IS offering at all levels. The IS program is well placed to leverage its capabilities in emerging areas of "big data" and "data analytics" along with its leadership in areas such as cybersecurity, health care, and banking systems. The IS program's initiative to offer its programs online will further provide working professionals with an opportunity to pursue graduate degrees and will effectively serve the professional community.

The external reviewer had ample opportunities to talk to various stakeholders including faculty (both graduate and undergraduate), program coordinators, students (graduate, undergraduate, and online), university leadership, and the support staff. While every group of individuals candidly discussed the challenges and opportunities facing IS programs, one common theme was that all of the individuals highly valued the IS program and its offerings and believed in the mission and direction of the IS program within the business school. It was pleasing to see the commitment and dedication of everyone to collectively create an excellent and highly relevant experience for the students and their future job potentials and to continuously strive to improve the program to keep up with the changing IS trends. Given the demonstrated success of the program, it is clear that the IS program has the right components in place, functioning quite well, and the next step is to focus on building enrollment at the undergraduate level with some innovative initiatives. In discussions with various stakeholders, it has also become evident that there are some misunderstanding or lack of understanding of the differences between the IS

programs and the offerings of the cyber school among various groups within the university (e.g., undergraduate advising), which needs to be seriously worked on and corrected. In this report, the external reviewer provides his impressions of the issues facing each of the IS program offerings and then concludes with some recommendations. Table 1 is a summary of the areas focused on by the reviewer.

**Table 1. Summary of the Focus Areas of the Review**

| | A.S. | B.S. | M.S. | Ph.D. |
|---|---|---|---|---|
| Program goals and strategic planning | | | | |
|     Appropriateness of goals and whether/not goals are being met | 4 | 3 | 5 | 5 |
|     Program goals relative to institutional mission | 4 | 3 | 5 | 5 |
|     Program goals relative to current national trends and forecasts for the discipline | 4 | 3 | 5 | 5 |
| Program resources | | | | |
|     Effective use of resources to meet program goals | 4 | 5 | 5 | 5 |
|     Faculty--staffing levels and credentials | 5 | 4 | 4 | 4 |
|     Classroom facilities | 5 | 4 | 4 | 4 |
|     Laboratory facilities and equipment | 5 | 4 | 4 | 4 |
|     Financial support | 4 | 4 | 4 | 3 |
| Program curriculum | 5 | 5 | 5 | 5 |
| Technology integration | 5 | 4 | 4 | 4 |
| Program assessment | | | | |
|     Appropriateness of assessment measures/activities for the discipline | 5 | 5 | 5 | 5 |
|     Major-field assessment activities, relative to the program goals | 5 | 5 | 5 | 5 |
|     Program accreditation, if appropriate | ND | ND | ND | ND |
| Student support/student enrollments | | | | |
|     Student recruitment efforts | 2 | 3 | 3 | 4 |
|     Student enrollment numbers | 1 | 1 | 5 | 5 |
|     Student graduation rates and student placement | ND | 5 | 5 | 5 |
|     Student support services | 5 | 5 | 5 | 5 |
|     Academic advising | 5 | 5 | 5 | 5 |
| Program strengths and areas for improvement | See the specific comments below. | | | |
| Specific issues identified by the university: program curriculum, program assessment, and program enrollments | | | | |

*1: Unacceptable, 2: Poor. 3: Fair/Adequate, 4: Good, 5: Excellent*
*ND: No data.*

# Part 2: Schedule of On-Site Visit

**DSU**
**DAKOTA STATE**

Dakota State University  •  820 North Washington Ave.  •  Madison, SD 57042-1799

**College of Business and Information Systems**
**Information Systems Institutional Program Review**
**On-Site Visit Itinerary**

## Wednesday, May 1st

6:00 pm                                Depart for Madison, SD

*AmericInn – (504 10th St, SE / 605-256-3076)*
*Check out 11:00 am and continental breakfast is provided.*

## Thursday, May 2nd

| 8:15 am | Arrive on campus |
| 8:30 – 9:00 am | Dr. Scott McKay, Provost/VP Academic Affairs<br> - Presidents Conference Room |
| 9:00 – 9:30 am | Dr. Dorine Bennett, Dean of College of BIS<br> - Presidents Conference Room – Heston Hall |
| 9:30 – 10:00 am | Dr. Jeanette McGreevy, Director of Assessment<br> - Presidents Conference Room – Heston Hall |
| 10:15 – 11:00 am | Tour |
| 11:00 – 11:45 pm | Conversation with coordinators<br> - Regents room |
| 11:45 – 12:45 pm | Lunch<br> - Marketplace / Regents Room |
| 1:00 – 2:00 pm | Conversation with Undergrad Faculty<br> - Regents Room |
| 2:00 – 3:00 pm | Conversation with Information Systems students<br> - TCB 109 (someone set up Collaborate) |
| 3:00 – 4:00 pm | Resources<br> - Regents Room |
| 4:00 – 4:30 pm | Internships<br> - Regents Room |

**Friday, May 3<sup>rd</sup>**

10:00 – 11:00 am            Conversation with Graduate Information Systems Faculty
- Regents Room

11:00 – 12:00 am            Research (Pam, Mark, Pete, Josh, Dave)
- Regents Room

12:00 – 12:45 pm            Lunch
- Marketplace / Regents

1:00 – 1:30 pm             Coordinator wrap up
- Regents Room

1:30 – 2:00 pm             Exit interview
- Regents Room

2:00 pm                Depart

## Part 3: Program Evaluation

### 3.1    Program goals and strategic planning.

The goals and objectives of the IS program are reasonable and are at par (if not better than) with the other comparable institutions. Because of the diligence in setting and pursuing these goals and objective, the IS program at Dakota State has built an excellent regional reputation. This reputation is based on the program's faculty, who have contributed significantly by providing and nurturing the intellectual capital of the educational program. The faculty has been and continues to be very productive in teaching and service. The potential criticism and financial strain arising from the low student enrollment in the IS undergraduate programs can create challenges for the college in the near future. To elevate this undesirable situation, creative and innovative initiatives are needed to improve undergraduate enrollments. All things considered, the IS programs seem to be in very good shape, striving to set ambitious goals and objectives, and successfully achieving them.

### 3.2    Program resources

Because of its nice alignment with the new mission and vision of the institution, there is (and has been for a long time) very strong support for (and high expectations from) the IS programs at DSU. The computing and library resources provided to the IS programs are at par and perhaps better than most of the comparable schools. For instance, students at DSU enjoy unique access to technology—DSU was not only the first institution in the region to provide portable personal laptops and a campus-wide wireless network overlay but one of the first in the nation to do so.

IS faculty at DSU is highly productive with respect to teaching and service but should also be provided with the means/incentives to be more productive on the research front. Both

tenure track and non-tenure track faculty are highly dedicated to the IS program and its offerings. Although non-tenure track faculty are not expected/required to be involved in administrative/service related activities, a significant number of them are involved in related initiative along with teaching and advising. Historically, the IS program's faculty has been especially strong in the technical and practical aspects of IS. Faculty members working in the technical domain have played a central role in creating the program's reputation via their productive educational programs. This is clearly the strength of the program, and currently represents at least half of the faculty. However, in the last few years, a substantial number of faculty have joined the program to provide a better connection with the managerial and economic streams of IS research, connecting the program to more mainstream IS research and providing a better balance and connection with the finance and banking community.

The department needs more tenure track and non-tenure track faculty to meet its growing teaching needs and to deliver on opportunities that exist for expansion of its programs. This is a necessity if the research productive faculty are to the awarded with course releases. While the shortage in new hiring due to financial constraints is understandable, it is of critical importance that the department is able to recruit replacements (due to retirement and turnovers) as well as new faculty to take advantage of the opportunities. Since the dotcom bust of the early 2000s, the IS enrollments are steadily rising nationwide in undergraduate programs and the IS program's experience with increased demand for its master and doctoral programs should be leveraged to increase in its undergraduate programs as well.

Overall, in the reviewer's opinion, the IS faculty is a dedicated group of individuals who share a collective and futuristic vision for the continued improvement of the IS program. The school and the university should address the incentives (financial and course release), reward the

research active/productive faculty, and think about implementing a merit-based rewarding and salary adjustment policy. To get to the next level on achieving regional and national reputation, the administration should deliver on its promised growth in faculty size to take advantage of the growth opportunities that the IS program's strengths are well suited to exploit.

The Is program is enjoying state-of-the-art resources related to classroom, laboratory, and network facilities and related equipment. These resources are better than most of the other similar schools nationwide.


### 3.3 Program curriculum

The current state of the IS programs seems to have the latest classes in their respective curriculum. The IS field and related educational needs and requirements are going through a significant transformation. Analytics (at descriptive, predictive and prescriptive levels), big data, IoT, AI and machine learning, web/app development, information assurance, etc. are the recently emerged trends in IS. This constant change requires IS program faculty and administration willing and able to change and transform their curriculum to stay relevantly, and to add value to their students' education. The IS faculty and administration at DSU seems to fit very well with this definition. They have changed their course and program offering to take advantage of the emerging trends several times in the last few years, and by doing so, maintaining a state-of-the-art curriculum.

Keeping up with the constantly changing trends in the IS field seems to be straining the resources (especially the faculty resources) at DSU. Forming new programs and specialization, and creating and teaching new courses require additional faculty lines to succeed. Otherwise, the teaching load on existing faculty will keep increasing, leading to burnout and attrition.

**3.4     Technology integration**

DSU in general and the IS program in specific seems to be technologically enhanced. From personal computers to the wireless network, data center to the state-of-the-art software, the IS program enjoys an integrated technology/computing infrastructure that is significantly better than most other comparable institutions.

**3.5     Program assessment**

The IS program has proper plans in place to assess the individual degree programs. These plans are well established for the BS CIS, MSIS, and Ph.D. programs and in-progress for the newly launched AS WebDev program. The assessment plans and practices are on par with similar schools and programs.

Although university level accreditations are well in-place (granted accreditation by the Higher Learning Commission for a period of ten years in 1961 and this accreditation has been continued after each comprehensive visit, the last of which was in 2018), the IS programs accreditation is still in the exploratory stage. Perhaps looking into (and potentially pursuing in the near future) AACSB type national/international accreditation practices would help streamline academic practices and create differentiation for the IS program and the college.

**3.6     Student support / student enrollments**

During the visit, the reviewer had the opportunity to meet and talk with several undergraduate and graduate and online students. The common testament of the students about the IS program was very positive. They especially positively commented on the depth of knowledge and the

over the top helpfulness of the faculty. In addition to the excellent faculty, the satisfaction of the students with the IS programs can also be attributed to enhanced job opportunities and job placement rates in the field of IS.

The low enrollment numbers in IS at the undergraduate level are a national problem and not unique to Dakota State University. This problem started with the "dot com" bust and the perception that all IS or IT jobs are being outsourced. Therefore, guidance counselors and the parents of potential students are convinced that the employment opportunities in Information Systems are not very good, which is obviously not true. Outsourced jobs are returning to the US as the IS industry figures out what works and what doesn't work. However, a marketing campaign of the latest trends must be launched internally (for the advisors and guidance counselors) and externally (for parents and students). The university staff could visit high schools within a reasonable radius to familiarize high school students and high school faculty of the opportunities in Information Systems. For the close-by high schools, a course (or a partial course) can be taught by the IS faculty to explain the "cool features of IS to the junior/senior classes. Also, regional finance and banking, health care, and IT companies and communities could be used in the advertising campaigns for their need for talent in information systems. These approaches have been successful in other similar settings.

Based on the reviewer's observations and interviews with relevant staff members, student support services and academic advising need to be educated about the differences between the cyber school offering and the IS program offerings. Although they have the best intentions, these student first contact people need to know the differences so that the incoming students can be advised to pursue what they are really passionate about.

**3.7     Program strengths and areas for improvement**

The IS program seem to have all the necessary ingredients: visionary and motivated leadership, diligent, motivated, knowledge faculty, latest specializations and programs, state of the art curriculum, ample technological and computational resources, and unwavering support staff. The goal should be to maintain (and continue on improving) these ingredients while improving the undergraduate enrollments by implementing creative and innovative recruitment practices.

**3.8     Specific issues identified by the university: program curriculum, program assessment, and program enrollments**

The university leadership seems to be very happy and supportive of the IS program and its offerings. Well-aligned with the new mission of the university, the IS program plays a key role in the prominence of the college and the university. The enrollment numbers at the undergraduate level, although not mentioned as a very significant issue by the top administrators during the visit, it needs to be improved to prevent future problems and criticism.

## Part 4: Recommendations for Continuation and Change

## All four programs

- Keep up with the-state-of-the-art in IS program and specialization offerings.

- Maintain excellence in teaching. Educated, skillful, and satisfied students are perhaps the best advertising/publicity agents for the IS programs.

- Enhance the research component of all four degrees.

- Work closely with the cyber school faculty for collaborative grant proposal and top journal publications.

- The most valuable asset of the IS program is its highly dedicated and productive faculty. To retain this most values asset intact, the school has to put the means in place (by properly addressing faculty incentives in term of salary and course release for research) to keep the faculty motivated, productive, and engaged.

- Continue to pursue assessment programs for accreditation, perhaps with an internationally acclaimed and recognized accreditation body such as AACSB.


### AS WebDev Program

- Publicize it better and more broadly to increase the enrollment numbers.

- Focus on the shorter time required to get a degree. Make sure the potential students know the seamless progression towards the BS CIS degree if desired.

- Emphasize the job potentials as Web developers by the companies in the region. It would be a great idea to collect and use memorable quotes from the regional company recruiters focusing on the great job potentials for Web developers.

- Recruit not only from within DSU but also from outside.

- Educate the student counselors and adviser about the program so that they can properly convey the true definition of the program to the potential students.

**BS CIS Program**

- This program suffers from low enrollment numbers. Publicize the BS CIS program better and more broadly to significantly increase the enrollment numbers.

- Advertise heavily to the regional highs schools by not only educating the high schools' faculty and administration but also presenting to the junior/senior classes, teaching a course (or a part of an existing course).

- Make sure to reach out to the parents as well as the students with the proper recruiting messages.

- Consider organizing a summer camp on "cool IS topics and skills" for a selective group of successful high school students. You can find sponsors for such an event. Regional potential employers and tech companies love to be a part of such a community event. It does not have to be long. One or two weeks would be sufficient to convey the message to the student you want to recruit. This has shown to work very successfully at some other IS schools around the nation. Not only it helps in recruiting but also help build a student and education focused image of the program and the college.

- The existing specializations and curriculum are up to date with the current state of the art. Keep up with the efforts to stay relevant and current with the changing trends in IS. Make sure to include your highly relevant and current specializations in your publicity initiatives.

- Educate the student counselors and advisors about the differences between the cyber

school offerings and the IS programs. By doing so, try to get out of the shadow of the cyber school to recruit the student who is genuinely interested in IS programs.

- Increase the undergraduate level honor classes and research engagements.

**MSIS Program**

- Offer data analytics as a specialization in the MSIS program. By doing so, you can tab on the increasing popularity of analytics. This would not jeopardize the integrity of the MS in Business Analytics program (a collaborative MS program with SDSU) but would help recruit students who are interested in an MS in IS degree with an analytics specialization.

- Pursue and obtain STEM designation for the MSIS program. STEM designation makes the MSIS program more attractive to international graduate students.

- Make sure that all undergraduate students are aware of the advantaged of the 4+1 program (stay one more year get a master degree). Work with other undergraduate programs at the cyber school to enrich the 4+1degree offering between colleges.

- Create a close relationship with the companies in the region for curriculum updates and improvements, internship, employment, student projects, class presentations, and even for the industry-funded collaborative applied research project.

**IS Ph.D. Program**

- Moving from D.Sc. to the Ph.D. program was a smart decision, as it lines up better with the rest of the high education offerings, creating a consistent message for the potential applicant.

- The enrollment numbers in the Ph.D. program is impressive. It is obvious to the reviewer

that the school has created a very successful doctoral program, and should do their best to keep it there, at the top.

- There are no substantial incentives for the faculty who teaches and advises in the Ph.D. program. The faculty carries out these duties because of their dedication to the school. There has to be a tangible (monetary stipend) and intangible (partial course release) incentives for the faculty who is heavily involved in the Ph.D. program.

- The research component of the Ph.D. program needs to be improved. This would be achieved with the right set of incentives extended to the faculty so that they would have the time and desire to dig deeper with the student for more substantial research and measurable outcomes (journal papers and even grant proposals).

- The Ph.D. program seems to have a significant online component. Rigorous Ph.D. level research requires a constant connection to the faculty advisor for mentoring. Often, such a close collegial relationship can only be achieved in the physical presence of each other. Periodic visit to the campus can be a solution to the problem. Such an environment need to be created for the long term in order to maintain the notable success of the Ph.D. program.


--End of the report.