TECHNOLOGY

INTRODUCTION AND BACKGROUND
Technology is ever changing and always evolving. Bismarck State College continually faces changes on the campus in respect to leadership, technology, and growth as a result of changes in enrollment, academics, and requirements placed on us by insiders and outsiders. Over the past six years, Bismarck State College has seen significant changes for the campus, especially in technology. There have been so many significant changes regarding campus technology that it will be helpful to summarize and categorize our technology environment over the past six years.

Technology has had a positive impact on the entire campus making communicating, learning, and productivity more efficient. Blogs composed by the President and various campus departments keep communication open and informative to everyone. Scanning and imaging processes are making departments paperless and maximizing efficiencies. Training opportunities on a variety of topics are available to all employees. Recent migration to a system wide managed Active Directory gives students and employees the ability to log on to different applications (PeopleSoft Applications, email, etc.) and networks throughout the university system using the same login and password.

Classroom and teaching technology have taken over classrooms and computer labs in recent years creating an atmosphere to engage and connect with students. Smart boards and clickers provide interaction with students and enrich the learning experience for the student as well as provide feedback that assesses delivery and learning of subject matter. LAN school software allows faculty to control workstations to display information or interact individually with each student. Instructional design coaching helps the faculty use technology and tools to design and enhance student learning. Smart classrooms or smart boards are utilized in almost every classroom on the campus. The number of computer labs and student to computer ratio has grown to meet the increased needs for technology, teaching, and learning.

Bismarck State College has expanded the use of technology by providing a number of different simulators so students can train and gain “real life” experience such as computerized welding simulators. Energy technology offers multiple types of biofuel, distillation, and boiler simulators, as well as computer based and digital control systems tied to training units to mock control room environments. Some of these simulators are offered to both online and on campus students. Instead of textbooks, nursing students use Apple iPod Touch devices giving them flexibility in the classroom and during clinical work experience.

LESSONS LEARNED FROM STRATEGIC PLANNING COMMITTEE FOCUS GROUPS
A considerable amount of time and effort has gone into visiting with many stakeholders of Bismarck State College to determine their views of where BSC has been, where BSC is currently, and where BSC should be headed. From these focus groups it became clear that technology is a significant issue. Unfortunately, not all responses were self-explanatory. Under “Strengths” some people put “technology”; under “Weaknesses” some people put “technology”; and under “Opportunities” some
people put “technology”. This helped us see that technology is viewed as a major component but did not offer a clear direction defining where we should be going with it. Technology that is used to provide a hands-on experience for students always showed up as a positive thing. Many responses suggested that not only electronic textbooks, but electronic textbooks that provided for an interactive experience were needed. More extensive use of eCompanion or similar sites were mentioned as favorable things. Some of the negative concerns included the cost of acquiring or maintaining software, warnings about not trying to reinvent the wheel, the difficulty in deciding where in the life cycle of software we should be, (especially taking into account the cost of constantly purchasing the newest version of software), and the need to keep faculty, staff, and students up-to-date with technology.

Lessons Learned From Past BSC Experiences

Bismarck State College has learned a great deal about maintaining a technology base that provides for a quality education as well as an efficient process for organizational operation. Some of the lessons identified were very positive while others provide us with more challenging factors. Many of the less than favorable lessons can be attributed to the fast pace that must often be adopted when dealing with change. Perhaps the fact that we often put ourselves in the leadership role rather than in the following role can also explain some of these situations.

Communication in dealing with technological advancement would seem to be of the utmost importance. The guidance needed to do this must come through the involvement of the many people with the knowledge and experience necessary to make the correct decisions regarding updating of hardware and software on campus. In addition, appropriate training must be provided to employees to help them incorporate appropriate technology into their classes and offices. At the same time, it is necessary to keep the best interests of the student, employees, the university system, partners and stakeholders in mind. To address these and other issues a Technology Advisory Coordinating Committee (TACC) was created as a positive step in improving the communication among departments.

Also of major concern, the dollar and human costs need to be a consideration that is carefully studied and researched. The significant dollar cost of keeping up, let alone moving ahead seems to come with a price tag that is starting to resemble the national debt. The questions regarding the best methods of obtaining future technology need to be researched very carefully since it appears that tuition and state aid may not adequately cover the future costs. Will the costs need to be shared by the students) or will the employers of the future, who desperately need highly skilled people, offer to help pick up the tab? Also, while technology is intended to make our lives easier and more efficient, the constant change places strain, hardship, and mental burnout on the people most closely connected to the adoption process.

National Trends

To maintain an institution at its highest standard, technology trends need to be evaluated constantly to determine which trends would most benefit our institution. It cannot be presumed that any single advancement in technology will automatically be beneficial to every school. The 2011 Horizon Report has identified the six emerging trends in technology likely to be seen in the next one to five years:
• Electronic Books to replace physical books
• Use of mobile devices to access course materials
• Augmented reality to enhance interactive learning (a program that is layered with intelligence to advance as you improve)
• Game-based learning to engage students
• Gesture-based computing to further engage students (i.e. Kinect, SixthSense)
• Learning analytics permits tracking of individual student progress

With the exception of these technological advances another trend is the need for an overall campus technology vision. Based off the ECAR (EDUCAUSE Center for Applied Research) study on IT Strategic Planning, institutions have identified the importance of aligning information technology (IT) organizational plans. Faculty and staff want input into IT direction, initiatives and priorities, as well as ongoing communications about IT progress and achievements.

**STRATEGIC THEMES**
Predicting the future role of technology in higher education is key to predicting the future of higher education itself. The use of technology can:

• streamline internal processes making operations more efficient
• allow campuses to reach beyond traditional borders to deliver to a more diverse population in a less time-constrained environment
• provide for greater collaboration between students, faculty, and industry

There are several concepts relevant to the use of technology at Bismarck State College.

• This college is one of eleven members of the North Dakota University System. While each campus has its own distinct background and role, the campuses are becoming more connected. Increasingly, large technology initiatives may be handled or dictated at the system level. Bismarck State College must lead within the NDUS or operate within its confines.
• Significant structural changes at the university system level, such as the use of a single learning management system for all campuses, will have a profound impact on students, faculty, and staff at this college and the entire NDUS.
• The cost of technology for this campus is increasing as it is being utilized in more areas and in more ways. Further, the increasing obsolescence of technology is driving overall costs even higher.
• Preparing students for career or industry-specific positions requires the use of technology as appropriate to each industry. In some cases, this may necessitate cutting edge technology. In other areas, technology doesn’t change as rapidly making the environment more of a challenge to support.
• As part of a recently awarded U.S. Department of Education Title III grant, BSC will develop a data management and integration project. Centralizing data and increasing data collaboration and access to it will aid in making more informed, data-driven decisions for the future of the campus.
**OPTIONS**

- **Electronic Textbooks** - According to an article titled “A $9.9 billion industry is about to get a serious makeover” found at Forbes.com, some experts predict that within the next 10 years, most U.S. college students – and many high-school and elementary-school students as well – will probably be reading course materials on an electronic device instead of a paper book.

Advantages of electronic textbooks are a lighter backpack and lower cost to the student. One disadvantage is that students currently using electronic textbooks have stated that when it’s time to read the material, they print it out which is costly to the educational institution in terms of paper and printer toner.

- **Single Publisher for All Textbooks** - Pearson, who provides Bismarck State College with the eCollege and eCompanion Learning Management Systems, has offered to provide the College with textbooks at a greatly reduced price. An advantage would be cost savings, while a disadvantage would be the limitation of textbook publisher choices.

- **Require Student Laptops** - Approximately 88% of college students own laptops, according to a study by EDUCAUSE Center for Applied Research, a Boulder, Co., think tank. Currently the Computer Support Specialist students are required to have laptops. This requirement has worked well for the program. An option for the future would be for all students to have laptops. This would greatly reduce equipment costs for classrooms and computer labs. Disadvantages would be compatibility issues with software programs, printers, and the BSC network.

- **Centralized Course Distribution** - Currently there is conversation in the state about creating centralized curriculum content. Presumably this relates to online classes more so than on campus classes but the goal would be to create efficiencies in preparation of courses taught by multiple sites and also to help ensure consistency in material taught.

**PROJECTED COSTS**

It’s difficult to determine the projected costs of technology on our campus. There are current and projected costs for the continuation of services and applications that are currently on campus serving the needs of students, faculty and staff. There are also projected costs for projects that are currently being planned for implementation. Finally there are the costs to evaluate future potential technology options to keep Bismarck State College at the forefront of institutions of higher education. The fact of the matter is there is never enough money available for all the needs of the school. In some cases the NDUS will cover costs for certain software applications because agreements have been made for the entire university system. In the past, federal grants and different types of aid have assisted in the expansion of technology on campus allowing the purchase of simulators, laptops, energy stations and healthcare units. It is expected that efforts will continue to seek future grants. In addition, the generous donations by businesses and groups as well as alumni and the BSC Foundation, have assisted the campus in many ways. Additional ways for BSC to continue enhancing its technology is to
collaborate with other campuses for services, cloud computing, and further efficiencies. These situations may help to keep projected costs from escalating.

**SHORT- AND LONG-TERM PLANS**

Short and long term planning is imperative for any institution. In some cases future plans have been mandated by the university system or as federal requirements. Currently there are several projects that are in the planning stages, with some of the projects already being implemented.

Cloud computing is not new to our campus. Currently cloud computing applications in use are:

1) The use of eCollege for distance learning. The delivery of online classes has been available to our students for a number of years, but the expansion of courses, simulator experience through the online class environment and the expansion of degrees available will continue.

2) Student and employee email systems have converted from server-hosted to email in the cloud.

3) Microsoft Office 365 will be implemented and expanded to provide hosted application and server access via the internet. This will allow for more collaboration and increased data storage. Additional communication features offering audio/video calling and conferencing will be available with the eventual replacement of our expiring telephone and voice mail systems. Additional software applications are in the process of being approved at the university level for enhanced collaboration and reporting.

Virtualization uses powerful servers to process data and reduces hardware requirements on computers. Recent collaboration with a NDUS university will allow us to move forward with plans, testing and future implementation. Desktop computers will be used for a longer period of time saving the college a significant amount of money. In addition, students will also benefit from this new technology. They will be able to use software for their classes from anywhere in the world by logging on to virtual servers.

The implementation of a campus card based security system is currently in the planning stages with the scheduling of this system to be rolled with future construction and renovation projects on campus. Eventually the security system will be incorporated with existing buildings as well. Additional modules, such as student dining services, dorms, library use, and athletic admissions, will be considered for implementation as time and money permit.

In conclusion, technology is a major focus for Bismarck State College. With constant technological change, it will be critical for the college to continue with short and long range plans and collaborate with internal and external areas in order to remain up-to-date.