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I. Executive Summary

A. Background

In early February 2011, in anticipation of the arrival of new Vice President for Information Technology/CIO Sean Reynolds, and building upon planning work undertaken by the Enterprise Systems Steering Committee (ESSC) over the past two years, Provost Dan Linzer and Senior Vice President for Business and Finance Gene Sunshine requested an evaluation of the current delivery model of Northwestern’s enterprise business systems. The scope of this review was to include those systems supporting student administration, human resources, alumni relations/development, financial management, research administration, facilities management, and reporting. Jason Schober, Director, Project Café; Cathy Grimsted, Associate Dean of Administration and Finance, Weinberg College of Arts and Sciences and ESSC chair; and Dona Cordero, Assistant Provost for Faculty Development/Director, Office of Change Management, were asked to conduct this assessment.

To gather the input that serves as the basis for this report, we interviewed a population of key stakeholders – including the enterprise system implementers and the systems’ customers and users. We supplemented these interviews with a brief review of other institutions (via review of web sites, discussions with other schools, and a knowledge-sharing session with Huron Consulting Group) and a review of reference materials, including previous reports and surveys completed in the past couple of years. We are very grateful for the time and insight that our colleagues shared with us throughout this endeavor.

B. Key Themes

Throughout the interview process, it was evident that there are many very skilled, conscientious, and dedicated staff members working hard to manage and support the University’s enterprise systems. A great deal has been achieved thanks to their efforts. While each individual system has strengths and weaknesses, there was a general sentiment that projects that were developed using a clear plan, implemented following a rigorous methodology, and sustained using broad community engagement have fared well.

In terms of areas that should be considered for future enhancement and growth, several items were noted. They are identified in the key themes that emerged as the interviews progressed:

- **Leadership** – ultimate authority for decision-making, at the institution-wide level and within each unit
- **Organization** – structure, reporting relationships, roles and responsibilities
- **Strategy/Prioritization** – how we determine our objectives, how we determine which initiatives we pursue in the effort to achieve these objectives, how we monitor and govern these items while they are in process
- **Project Management/Methodology** – approaches to project planning, estimating, execution, and closeout; includes common components of a software development life cycle such as initiation, requirements analysis, system design, technical build, testing, and rollout
- **Communication** – multi-directional exchange of information between systems implementers, central and school administrative offices, and users; via multiple channels
• **Data Access/Analysis/Integration** – access to data via reporting tools, online system access and system-to-system access (e.g., integration, interfaces); capabilities related to analyzing the data obtained

• **3rd Party Software Implementation/Integration** – the in-house development and/or acquisition, implementation, integration, and ongoing operation of software applications other than the primary enterprise-wide business systems

• **Security** – protocols related to access to systems, viewing of data within systems, and exchange of data between systems

• **Business Process and System Training** – the delivery of information about the usage of new and existing systems and corresponding best practices/policy considerations

• **Support/Help Desk** – fielding and answering questions from the user community, resolution of issues and incidents

C. **Summary**

As stated in the request from the Provost and the Senior Vice President for Business and Finance that we undertake this assessment, “Northwestern has reached a point at which it is now desirable to evaluate the development of a more cohesive University enterprise business systems strategy. In that way, the outstanding work that is already being conducted within each of the enterprise systems teams can be enhanced, and we can develop strategies for providing better service to the functional units across the University.”

As we consider Northwestern’s current enterprise business systems, the following conclusions are evident:

• We have (or in a few cases will do so very soon) implemented market-leading software applications for all of the enterprise system areas known as the main “pillars” within our industry – human resources, student administration, finance, research, and alumni/development. Within each “pillar” we are noteworthy among our peers in the breadth of functions or modules that we’ve implemented. The hard work and strong expertise of our staff that have worked on these implementations and subsequent initiatives are highly valuable assets to our University.

• Whether in the arena of making systems easier to use, data easier to access, or processes more efficient, the general consensus in the user community is that there is much left to be done. While we are reaping the benefits of our current systems versus their legacy counterparts, a significant potential for inefficiency and/or lack of capability persists. Needed improvements are often of a cross-system nature or relate to “infrastructure” elements of some sort – technical or procedural – and, as such, can be in competition with initiatives more fully confined to a single system’s purview. Many projects are “required” – often for regulatory or contractual reasons – and, thus, all of our attention must be split among these new initiatives and continuing to support and enhance our existing core enterprise systems.

• Given that we have been at work implementing our current enterprise systems for well over 15 years, it is not surprising that more than one model of organizing our teams, supporting our users, or even financing our investments has been employed. More striking is that, although the contrasts between the systems themselves are not inherently at issue, each enterprise system’s
delivery model truly is distinct from the next. The persistence of these differences may be hindering our ability to continue to meet the demand described above in a resource-constrained environment.

The conclusions offered above and the various considerations presented in this report strongly support an integrated approach to our enterprise business systems, a concept that is also prevalent in the initial planning work undertaken by the ESSC over the past two years. We can no longer afford to take different approaches, in part because we are constrained by resource realities, but even more so due to the high degree of cross-system collaboration that many future initiatives will entail (e.g., integrated reporting and analysis, use of an enterprise business portal, document imaging, etc.). This need for an integrated approach is also in keeping with broader trends related to online services where the users of our systems expect – at their workplace and beyond – that solutions will be highly accessible, tightly integrated, and powerful enablers of management and decision-making.

Pursuing the considerations within this report will help the University to optimize its enterprise system functions, delivering positive outcomes for students, faculty, staff, and decision makers. This should not be perceived as a panacea of cost savings, however, as it may take several years (and perhaps investment in the short term) to realize the benefits of some of the ideas presented in this report. Strong leadership, particularly in the form of an integrated approach to prioritization and achievement of goals that are cross-system in nature, will be necessary throughout this process, enabling the University to balance its improvement goals with available resources.
II. Introduction

A. Our Assignment

In early February 2011, in anticipation of the arrival of new Vice President for Information Technology/CIO, Sean Reynolds, and building upon planning work undertaken by the Enterprise Systems Steering Committee (ESSC) over the past two years, Provost Dan Linzer and Senior Vice President for Business and Finance Gene Sunshine asked that we evaluate the current delivery model of Northwestern’s enterprise business systems. The scope of this review was to include those systems supporting student administration, human resources, alumni relations/development, financial management, research administration, facilities management, and reporting.

The project team comprised:

- Jason Schober, Director, Project Café
- Cathy Grimsted, Associate Dean of Administration and Finance, Weinberg College of Arts and Sciences and ESSC chair
- Dona Cordero, Assistant Provost for Faculty Development/Director, Office of Change Management

We were asked to consider potential options related to the current enterprise systems delivery model, to develop a high-level plan for modifying the current model, and to define the specific steps under this plan that would best enable the University to address the functional needs of the University going forward. This summary report to the Enterprise Systems Executive Committee (ESEC) was requested as the deliverable for this project.

B. Our Approach

Our approach to this project consisted of three components: 1) an information gathering phase with the enterprise system implementers, 2) a subsequent information gathering phase with the systems’ customers, users, and stakeholders, 3) and a review/analysis phase. As requested in the project charge, we focused our analysis on those enterprise systems supporting the student administration, human resources, alumni relations/development, financial management, research administration, facilities management, and reporting functions at the University.

To gather the input that serves as the basis for this report, we interviewed a population of key stakeholders (see Appendix A for the list of Northwestern staff with whom we consulted). To assist in the identification of principal topics on which to focus in our report, we employed a standardized set of questions (see Appendix B). Participants were encouraged to speak candidly in our discussions and were told that there would be no attribution to individuals in our report. We supplemented these interviews with a brief review of other institutions (via review of web sites, discussions with other schools, and a knowledge-sharing session with Huron Consulting Group) and a review of reference materials, including previous reports and surveys completed in the past couple of years.

We are very grateful for the time and insight that our colleagues shared without us throughout this endeavor.
C. Structure of this Report

As we have reviewed the feedback gathered in our conversations, several key themes emerged. We have structured this report along these ten topic areas. In the sections of the report that follow, we have presented the leading observations from our work and a series of considerations intended to advise senior leadership on the delivery model for the University’s enterprise systems as we move forward.

The ten overarching themes are:

- **Leadership** – ultimate authority for decision-making, at the institution-wide level and within each unit
- **Organization** – structure, reporting relationships, roles and responsibilities
- **Strategy/Prioritization** – how we determine our objectives, how we determine which initiatives we pursue in the effort to achieve these objectives, how we monitor and govern these items while they are in process
- **Project Management/Methodology** – approaches to project planning, estimating, execution, and closeout; includes common components of a software development life cycle such as initiation, requirements analysis, system design, technical build, testing, and rollout
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- **Security** – protocols related to access to systems, viewing of data within systems, and exchange of data between systems
- **Business Process and System Training** – the delivery of information about the usage of new and existing systems and corresponding best practices/policy considerations
- **Support/Help Desk** – fielding and answering questions from the user community, resolution of issues and incidents
III. Leadership

A. Observations

Each of the University’s enterprise systems ultimately reports through one or more Vice Presidents and/or Associate Vice Presidents. These leaders are involved in setting the priorities for these systems either directly or indirectly. All of these leaders have very full portfolios, of which the systems are only one component.

In recent years, the Enterprise Systems Executive Committee (ESEC) has played an important role in governing several of the top priority initiatives, including Project Café, the Faculty and Staff Information System (FASIS), and Web-Based AIMS. This model has proven effective in several regards, notably the ability to remove roadblocks that might impede progress on these highly visible projects and the existence of a standing forum for the discussion of scope, timeline, and resource considerations.

In our discussions during this assessment, several stakeholders observed that certain initiatives are more challenging to get traction on from a “bottom up” approach, particularly when there is no team obviously tasked to take a lead role. Document management/imaging and single sign-on (SSO) are examples of such cross-functional topics. In a similar vein, the stakeholders we interviewed expressed a desire to know more about the strategic priorities that the institution’s senior leaders wish to advance.

B. Considerations

While it is impractical to expect the senior leadership of the University to engage on every enterprise systems decision, we are unlikely to move beyond the status quo without additional direction. We are in an interesting time period where, simultaneously, there are limited discretionary dollars available due to the financial climate, the University is about to unveil its new strategic plan, and there remains a pent-up demand for additional enterprise system projects, particularly those related to integrated data access and analysis. Some specific areas where senior leadership input would be very valuable include:

- Developing a highly transparent budget planning approach that takes a holistic view to enterprise system priorities and investments. Of value would also be to evaluate the funding model – including the use of recurring versus non-recurring funds, but also where central budgets are supplemented by contributions from other units – related to these systems. How school technology resources – financial and staffing – are allocated and prioritized is also worthy of some level of review.

- Including system implementers when planning programmatic changes. Northwestern’s academic structure in SES is particularly complex, a result of several factors, including the degree to which programs are set up with different parameters (e.g., calendars). The potential use of multiple currencies or different reporting years with the advent of the NU-Qatar campus is another such example. Respecting the fact that the University should and must pursue strategic opportunities, we should establish a framework that would create an open forum for discussion, such that system implications can be taken into consideration when programmatic initiatives can be tweaked subtly to simplify business costs.

- Clarifying what charge has been issued to which parties as it relates to the governance of the enterprise system functions. Also worthy of clarification is the scope of systems over which
these governance systems sit. For example, the full portfolio of student and faculty-facing systems now includes those programs offered by our graduate and professional schools, various functions under the umbrella of Student Affairs, and other niche systems (e.g., an advising system for Athletics). Leadership and governance of the student function should be aligned accordingly.

- As we move further into a mode where cross-system projects are the norm, senior leadership has the opportunity to declare its priorities, including areas where it wishes to make a “top down” decision in order to accelerate and make more efficient our ability to accomplish objectives such as integrated data access and analysis. Examples of areas in which such an approach may be necessary involve common organizational unit structures, person-identifier codes, standard roles, data access/viewing privileges, and faculty-centric data for research management.
IV. Organization

A. Observations

Many of the comments offered during our research focused on the fact that the responsibilities for the University’s major enterprise systems fall under different entities in different VP areas, the systems and their support models have overlapping functions (in some cases), and the roles and responsibilities of those individuals supporting the systems need clarification.

Several of those interviewed noted that the units with responsibility for the University’s enterprise systems work in “silos,” which can make collaboration and support challenging. These silos pertain not only to the lines between systems teams (e.g., financials, student, and human resources), but also within many of the systems teams themselves (e.g., functional, technical, reporting, infrastructure). Several comments indicated a need to look at the reporting relationships among the technical and functional staff in the various systems areas as well as the physical locations of the staff.

Another sentiment expressed numerous times was that often people don’t know to whom they should go to with questions, nor from whom they should request support since there are so many groups performing systems-related functions. There were also comments and questions related to schools/units developing their own systems/applications. One reason offered for schools/units developing their own solutions is that it is easier to work around central processes than to work with them.

One final area that should be noted is related to the business analyst (BA) role in the University’s enterprise system teams. Several individuals commented that the distribution, reporting relationships, and role of business analysts are areas that should be explored further. There is a perception that some areas don’t have the level of BA support that they need and that the reporting relationships may not be optimal. There was input that BAs should not assume responsibility for training, communication, and help desk functions (rather, that these be performed by dedicated resources) so that they can focus on the core functions of their role. The importance of having a BA staff that is proportionate to each system’s development staff was also cited, for, without such balance, the tasks they would typically perform (e.g., requirements documents, functional specifications, test scripts/results, etc.) go undone or must be assumed by others, often the development team or the customer.

B. Considerations

Several considerations related to organization were offered by those interviewed.

- Many people suggested that a single unit with overall responsibility for all enterprise systems would provide the strategic leadership, management, and operational guidance that are necessary to alleviate many of the challenges described in this report. This unit could strive for a shared mission, vision, and set of strategic goals for all enterprise systems. In our discussion with Huron Consulting Group, they observed that this model is very common at other large research universities. While our web research efforts found examples of this model (the University of Michigan, for example), it is difficult to draw any detailed conclusions about the specific makeup of these teams from such a cursory review. Additional research into the models used at other schools and their relative levels of effectiveness may be a desired next step.
• An alternative structure mentioned in our interviews would entail bringing the functional, technical, reporting, and infrastructure staffs of each enterprise system into a consolidated team. This is similar to the model used during the implementation of the University’s new financial management systems and still in place for Project Café. Advantages of such a model would include increased coordination within each enterprise system team, particularly as it relates to delivering the portfolio of projects in that team’s queue in a given time period. Such a model would likely, however, entail the need for additional resources in several areas, particularly where resources are in a “pooled” model today, such as system engineers, database administrators, etc.

• Another consideration offered frequently was the establishment of a project management office (PMO) or a similar centralized project management team. A PMO could potentially address the coordination challenges that exist currently in managing projects, particularly those that cross system teams. Alternatively, a standard project management methodology and strong leadership from the top could bring about similar benefits.

• To help address the issue of not knowing to whom users should go with their requests, it was suggested that there is a need to clarify the roles and responsibilities of the individuals and groups supporting the University’s enterprise systems. This would help to identify resources for users, reveal redundancies in responsibilities, and leverage skills for the benefit of the University broadly.

• The impact of a shared working space in close proximity to the key stakeholders of the enterprise system teams should not be overlooked, as it can greatly improve coordination, particularly among resources working as a project team. We recognize that space is always in short supply at the University, so while we suggest that we integrate the enterprise systems teams from a space standpoint, it should not be viewed as a dependency that prohibits other improvements if such a co-location is not practical.

• A final consideration is to eliminate resource divides or ensure that there is equity in resource support across units/systems. During our discussions with the enterprise system implementers and their customers, staffing needs were voiced across many skill sets including business analysts, database administrators, system engineers, data warehouse developers, identity management specialists, and more. While many of these needs likely have merit, there are real constraints on the University’s ability to increase staffing in an incremental manner. As we move forward, we need the flexibility to organize our resources into project teams and other structures that support both 1) the effective pursuit of our strategic priorities and, 2) the ongoing support and maintenance of our enterprise systems.
V. Strategy/Prioritization

A. Observations

Strategy and prioritization were often cited as important themes throughout the interview process. Overall, there is a perception that there is no unified technology strategy from which all enterprise systems take direction and that the prioritization process could be enhanced. This lack of clarity of direction can lead to disparate processes across the various systems, confusion as to how priorities fit within the budget process, and competition for resources among system owners.

Several people noted that having the Enterprise Systems Steering Committee, looking at the “whole picture” for the University is effective for establishing expectations and priorities. Others noted, however, that the prioritization process isn’t yet working as effectively as it should, particularly with regard to cross-system initiatives. Each system team also holds regular meetings with one or more advisory committees dedicated to the systems and corresponding business processes that they support.

In our discussion with Huron Consulting Group, the development of a robust strategy and continued focus on prioritization (broadly termed “governance” in our discussion) was cited as a top criterion for the effectiveness of enterprise systems functions at other universities. Our review of other institutions’ web sites indicates the presence of one or more such governance groups at many of our peers; however, it is not possible to gauge the effectiveness of these structures. Additional follow up in this area might be warranted.

Other comments heard during this project:

- There is a need for more transparency with regard to priority setting, as there is a belief that the central administrative units are getting their needs considered and met first and that the needs of the schools are secondary. It was also suggested that some central units are more successful at obtaining resources than others. It was noted that these might be among the reasons that schools either develop their own systems or seek solutions to their needs via external vendor products.
- There should be a way to get small projects completed more quickly. An idea for consideration is to develop and implement an “express check-out process” of sorts for smaller projects so that they won’t get stuck behind massive projects.
- The degree to which our enterprise systems are customized is rather high and the existing customizations are not always taken into consideration when upgrading.
- A significant number of additional projects (often of low effort/complexity) that aren’t included in the initial prioritization process are added to the list throughout the year.

B. Considerations

The number of current advisory, steering, and governance committees with some role in the delivery of enterprise systems at Northwestern is quite high (at least one dozen, perhaps as high as two dozen). Many of these groups were formed long ago, often to tackle a specific issue or shepherd a specific project through its implementation. A great deal of time from some of the University’s most influential stakeholders is invested in these meetings each year. While there are numerous positive outcomes resulting from this devotion of time and effort, it is unclear that there is sufficient coordination across all
of these entities to lead us to conclude that we have an effective model in place. More likely is that the groups have overlapping roles that should be examined anew; some groups may no longer be needed. Further, it would be worthwhile to assess the membership of each group that is retained to ensure that the head of the unit being represented has his/her preferred proxy at the table.

We believe that the Enterprise Systems Steering Committee (ESSC) or some similar functionally-led governance committee should be a core element of the future governance model. As it is currently constituted, the ESSC is a relatively new entity, particularly when one accounts for the fact that its attention was heavily directed toward the University’s plans for a new financial system and selection of a new email/calendar/collaboration platform for the initial years of its existence. The committee’s involvement in the process to consolidate and review a list of potential enterprise systems initiatives for the FY12 budget planning process was the first such cycle in which it had played such a role. As such, it was the first instance in which ESSC had requested that specific information be collected by each enterprise system implementer and each Dean/VP area and be submitted to the committee.

While there is an assumption that a similar process will be followed in preparation for FY13, the specific request to do so has not yet occurred. If indeed the University intends to retain this process, it may wish to consider strengthening the linkage between ESSC and the existing governance groups related to each enterprise system. Some considerations for doing so include:

- Communicating a series of broader themes or issues along which it is expected the enterprise system teams will prioritize their portfolios of planned projects for the coming year
- Establishing a standard project business case template that should accompany each proposed new initiative, including information about the up-front and ongoing investment required, expected benefits, risks mitigated, and affected audience(s)
- Revising the charter of each advisory committee to note its linkage to the ESSC’s charter and corresponding planning calendar
- Establishing a decision-making process by which a prioritized set of initiatives for the coming year are delivered to ESEC, the Budget Planning Group, etc.
- Migrating to a longer planning horizon, particularly for large initiatives (e.g., upgrades, new system implementations); a rolling three year planning horizon might be appropriate

A natural outcome of the above components would be a unified University-wide plan for its enterprise systems. This would provide direction to the enterprise system implementers and provide a better understanding of what needs to be done to stay focused on the stated direction. It would provide owners and users with information to make resource allocation decisions. It would also provide an opportunity to strengthen the linkage of technology to the strategic objectives of the University.
VI. Project Management/Methodology

A. Observations

Upon its implementation, each enterprise system enters a mode in which its staff is able to devote some effort to follow-on projects (the capacity varies by team and by year). In some cases, these projects are required for legal or licensing purposes, such as updates for payroll or financial aid regulations and upgrades to newer versions of software, databases and operating systems. In other cases, the projects are more discretionary in nature, particularly as it relates to timing. Also broadly variable is the size of projects undertaken by team and by year (e.g., upgrade projects are far larger than more targeted enhancement efforts).

In any given year, many projects are completed successfully within and across the various system teams. Significant opportunity for improvement exists, however, with regard to how these projects are coordinated. Each team has a different methodological approach to its projects, and, while the approaches are more similar than different, this creates an effect as if the teams are “speaking different languages.” In some cases, project efforts require resources from multiple teams – or, in all cases when you consider that there are sub-teams within each group reporting to different managers. The ongoing work to create systems and processes around the setup of graduate student stipends is an example of such a multi-team project. Aligning resource availability is challenging, as each team has a large portfolio of projects with differing top priorities (e.g., determining the timing of an upgrade to the Cognos BI tool). Further, some projects conducted by one team impact other teams, such as those that manage systems that receive data from the system being enhanced (e.g., the impact of the new chart of accounts of NUFinancials on existing systems). Even with advance notification that there will be some impact, it is challenging to coordinate timing such that both groups are ready to make the necessary changes in unison.

B. Considerations

The University should consider the adoption of a standard project management methodology across, at a minimum, its enterprise system areas (and corresponding business process change initiatives). Such a methodology should include project request, approval, planning (including software selection), requirements gathering, design, build, test, rollout, and closeout components. It should also establish a consistent standard for communication, documentation, and status reporting throughout the lifecycle of the project. Accommodation for projects of different sizes within the standard methodology should also be provided. While an effort is underway in NUIT to establish a common methodology, its focus appears limited to the tasks and interactions of the technology groups involved in enterprise system projects; a broader scope would be more beneficial.

The topic of project management/methodology goes hand-in-hand with the overall prioritization of enterprise system efforts. A standard scoring methodology was adopted for the FY12 planning cycle and produced a consolidated list of projects for the first time. While this process was a positive step towards more integrated planning, additional coordination for cross-system projects is needed. The University may wish to enlist the assistance of a central project management office (PMO) in this capacity. For example, such a group could assist with the planning, estimating, and staffing of such complex, cross-system projects. It could also serve as a coordinating function during projects, driving the projects with a standard methodology and ensuring that all parties are contributing as necessary. There are many
models for such a concept and, if pursued, care should be taken to identify and build around the key variables that are likely to result in success in our local environment.

Additionally, attention is warranted in the area of projects that, while peripheral in nature, have an impact on the core enterprise systems. These projects are diverse and quite numerous. Examples include applications that are purchased to augment the capabilities of the core enterprise systems (e.g., Apply Yourself for admissions), tools which can either be freestanding in nature or tightly integrated (e.g., imaging solutions), and custom development that is undertaken in areas where there is no suitable packaged solution (e.g., development of systems for the tracking of graduate student applicants). These projects are often very successful and we support the rationale behind their genesis in most cases. It is important to highlight several aspects: 1) these projects often require time from the core enterprise system teams and, thus, need to be included in planned annual project portfolios, 2) the systems stemming from these projects must follow sound practices in areas such as security and consistent usage of data, and 3) we should expect that industry trends such as software as a service (SaaS) will only lead to an increase in projects of this nature. Our project management and methodology practices should, therefore, lend themselves to managing these critically important initiatives, too.
VII. Communication

A. Observations

Although communication is frequently an area of challenge, our research yielded positive signs in addition to areas for improvement. The communication-related feedback obtained from our interviews can be grouped into two basic areas:

1. Communication from system teams to users

Several recent enterprise systems initiatives, including several efforts in process, were cited as having good communication. Regular communication was provided to users via status updates, including what to expect, whom to contact with questions, and many other helpful pieces of information. In general, however, communication between system implementers and users remains a challenge. Often, multiple listservs are used by system implementers or support units to communicate system status, planned enhancements, and other news. Users expressed some dissatisfaction regarding which items are communicated via each method and how far in advance notice is provided. System implementers voiced frustration that their communications often may not be read by the user community.

One attempt at such communication, the NWU-COMP-ANNOUNCE listserv, is used by NUIT and other system implementers to broadcast system maintenance and outage information among technical areas. However, this listserv is not an effective substitute for targeted communications to areas affected by system changes. Its message frequency, format, and content are not suited (or intended) for system user consumption, nor do they contribute to an efficient means of notifying peer system owners. However, a similar (but modified) approach could perhaps be used effectively in the future.

2. Communication between system teams

In many cases, upgrades, patches, and enhancements to systems affect other systems. However, without adequate communication, system teams often feel caught off guard by the impact of changes made to another system. Conveying needs for servers, databases, and storage requires a good deal of coordination between the system implementation teams and the groups within NUIT’s Cyberinfrastructure group. The designation of “liaisons” for each application has been beneficial in reducing disconnects in this area of late. While many times standing meetings – ongoing or project-based – are used to reduce this challenge, better awareness, communication, and planning across teams would help to avoid situations that result in extra work for other teams – and ultimately affect users of one or more systems.

In part as an attempt to improve communication across teams, a standing meeting of the enterprise system directors has been in place for the past year. While this group has significant potential to keep each system informed of the upcoming initiatives that could have impact on other teams, thus far these meetings have been devoted largely to developing a common methodology for project prioritization and in compilation of the FY12 planning materials to the ESSC.
On a different level, several groups noted that, in their efforts to improve communications and knowledge-sharing, they have found peer-to-peer settings to be highly valuable. For example, we learned through our interviews that there are at least two regular meetings of stakeholders from the schools to discuss enterprise system-related challenges, ideas, changes, etc. The UNITS (University Network of Information Technology Specialists) listserv maintained by NUIT’s Distributed Support Services (DSS) group was also cited as a valued resource by which local support staff are able to confer with each other to help address user issues related to University-wide systems. Several lessons learned can likely be gleaned from these lateral modes of communication and folded back into the approaches and tools employed by the enterprise systems teams.

B. Considerations

To help address the issue of not knowing to whom users should go with their requests, it was suggested that there is a need to clarify the roles and responsibilities of the individuals and groups supporting the University’s enterprise systems. This would help to identify resources for users, reveal redundancies in responsibilities, and leverage skills for the broader benefit of the University. An online systems and services inventory/directory would be a useful tool to allow people to determine the appropriate person or unit to call.

Two schools mentioned that they had developed a “place to go to get everything” web site to support staff within their units. These sites and/or ideas about such sites should be shared across the University. In keeping with the web communication theme, it might be helpful and aesthetically effective to develop a standardized web presence across enterprise systems. Such a set of web sites could also serve as a highly visible point of access for information about projects, status, timeline, benefits, risks, etc. Dedicated staff would likely be necessary to maintain this type of web presence; current resources of this sort are very limited.

The idea of communication as a top-down process is outdated; there should also be equal emphasis on lateral and bottom-up (users to system owners) communications. One potential avenue for such interactions was suggested: an annual summit for systems owners, users, and school technology staff to get together to talk about best practices and network with peers. Similar forums (such as the Best Practices Forum hosted by the Office of the Provost) have been met with enthusiasm and would most likely be beneficial for enterprise systems. On a smaller scale, regular cross-area meetings with staff might be an effective way to refresh skills, compare notes, discuss how things are going, share best practices, provide insight, and answer questions.

Finally, it would seem that there are lessons to be learned from new technologies, such as Twitter, RSS feeds, and blogging. While these tools may or may not be the vehicle of choice by which our enterprise system users wish to receive their news, it is clear that users want some control over how often they are contacted and via what method. A welcome development, for example, would be a tool through which individuals could state their communication preferences – both medium and frequency. Specifically, such a tool that could allow users to turn off all email communications (including workflow notifications) with the exception of emergency notices (e.g., unplanned outages) might enable those individuals that have become accustomed to using RSS feeds or other mechanisms to work more effectively and not feel that they are being “spammed.” Other users could choose to receive all communications. Still others could pick a more middle of the road option such as a daily email digest.
VIII. Data Access/Analysis/Integration

A. Observations

Without the ability to readily access and analyze data within and across our enterprise systems, we are not reaping the benefits of our investments. Each of the University’s enterprise systems has means by which users can access its data; most, if not all, have tools by which this data can be extracted for further analysis. All of the systems also share the challenge that their users want additional capabilities in these areas. A very brief synopsis of the data access/analysis tools available in each system include:

- AIMS – within the client/server platform, a powerful lookup tool and many canned reports are available to users, although due to the dated nature of the platform, ease-of-use is a common concern and the tools are not distributed well beyond OARD. The move to a web-based platform will improve usability and the reports will be migrated to Crystal. Working in conjunction with the BI Solutions Team, additional Cognos reporting capabilities will be delivered in the next few years.

- HRIS – reporting is performed through a combination of PeopleSoft Query, canned reports accessed via Vista, and position management reports in Cognos. Working in conjunction with the BI Solutions Team, additional Cognos reporting capabilities will be delivered in each of the next two years – first with FASIS, then additional capabilities including detailed payroll data. Users of the PeopleSoft Query tool hold mixed opinions – those who are adept at it find it very helpful; those who are less proficient with it find it inadequate.

- SES – reporting is performed through a combination of PeopleSoft Query, canned Crystal reports, and Cognos (iStrategy warehouse). The Cognos functions implemented to date are focused on student records data (both canned reports and ad-hoc query ability); CTEC data is also available. Working in conjunction with the BI Solutions Team, additional Cognos reporting capabilities will be delivered in each of the next two years.

- Project Café systems (includes NUFinancials, InfoEd, and FAMIS) – Cognos serves as the primary data access mechanism. Canned reports and ad-hoc query from each system are supported on the Cognos platform. The vast majority of reports are from one data source at present; high user demand to pursue integrated reporting (combining financial, payroll, and student tuition data) exists. Some of the reports delivered via Cognos are perceived as being slow. PeopleSoft Query is only used by central office staff, in part because it was not customized to impose row-level security on the results. University financial statement preparation is supported by nVision, a native tool delivered with PeopleSoft Financials.

Additional desires were also expressed with regards to increasing access to data from SIMS (space management), Fundriver (endowment management), and other specialized University systems.

There was general consensus that there needs to be more systems/data integration. This need manifests itself in two forms:

1. Bringing data from multiple sources together for analysis purposes. A number of individuals expressed concern with having to go from one system to another to access and massage data in
order to create reports and provide information that can enable them to make meaningful decisions. At the very least it was suggested that individuals should be able to access data across systems without having to log in and out of individual systems in order to manually combine data.

2. Interfacing data between systems so that data can support additional business processes without the need for manual duplication. A number of users expressed frustration that data is often captured in one system, but that same data is not made available to another system, requiring it to be rekeyed. Two notable examples cited in our interviews included the desire to bring data about student affiliations/activities into AIMS to support fundraising segmentation and the general concept of using standard user profile elements (e.g., name, phone number, email address, home department) stored in HRIS and/or identity management systems across other platforms.

B. Considerations

This topic represents the top area in which improvements are desired. All stakeholders to whom we spoke expressed needs for increased data access, analysis, and integration. Even with the University’s substantial investments to implement powerful, modern business systems, many users are still maintaining shadow systems due to unmet needs in this area. The top priorities related to data access, analysis, and integration include:

- Establishing a shared set of strategic priorities for data access. While the BI Solutions team and Café team have been steadily at work on a prioritized list of initiatives aimed at improving data access, it is unclear that there is broad consensus that the appropriate set of projects is being undertaken. This is not to say that users doubt we should continue to enhance data access to HRIS, SES, and AIMS via Cognos. In our discussions, they acknowledge that these efforts are essential and, once completed, will enable substantially improved analytical and management capabilities. There is, however, a broader sense that data access initiatives should be treated as a higher priority as it relates to resource allocation and project prioritization. One item that appears to have near-unanimous consensus is that the construction of a data repository that captures transactional detail from NUFinancials, HRIS (payroll expense and encumbrance), and SES (tuition expense and encumbrance) and associated data access capabilities should proceed as soon as possible. This is the most prominent of several such areas of demand for integrated data access and analysis.

- Determining the requisite changes to data structures to enable increased data integration. It is reasonable to speculate that the University’s quest to deliver integrated data analysis capabilities to the user community will be met with substantial roadblocks if the data themselves are not optimized for integration. Of particular note are the disparate organizational unit values/rollup hierarchies present in many of our enterprise systems. The primary management unit (PMU) project has made some solid headway towards using a crosswalk approach to this potential data integration challenge. It is unclear at this stage, however, if we can state with confidence that this approach will enable the cross-system analyses that the institution wishes to perform, or, if we need to plan to approach a standardized organizational data dimension in another fashion (e.g., change the organizational unit data structures at their source in the enterprise systems). Similar, but likely less invasive and effort-laden, questions would appear to exist as it relates to person-identification codes in
the various systems. Also relevant to this area is the fact that, if data are to be made available for analysis in other systems (transactional or reporting), projects may need to be undertaken to send those data to those systems. The idea of encumbering student tuition charges is an example of such a potential project.

- Identifying (or developing via training and/or recruitment) the resources that will construct, implement, and support these data access tools. We have learned that the work involved to create data repositories to support data access via the Cognos BI tool is substantial. We are already, in effect, constrained in our capacity to tackle additional projects without additional resources in some of these highly specialized skill areas. Also, there remain limited resources within the HRIS, SES, and AIMS teams trained in/devoted to Cognos, raising questions about who will construct, implement, and maintain these data access capabilities during the next 1-2 years and beyond. Opportunity may exist to broaden the population of staff trained in skills such as report writing to alleviate, at least in part, this resource constraint. For example, report development may be a task that could be undertaken by many of the more data-savvy business analysts on the various enterprise system teams.

- Building deep expertise within the Northwestern community to use our data access and analysis tools. The rollout of the Cognos BI suite within the past 2-3 years represents a substantial change that not all users have acclimated to at this point. The various tools (e.g., canned reports, ad-hoc reporting via Query Studio, report development through Analysis Studio, etc.) are very powerful, but, thus also require training and, for many, a learning curve. We must do more to enable users at all levels to maximize the benefits of these tools. This may need to follow a tiered approach, where the focus on the casual user is helping them locate and run commonly used reports. A middle tier of users can likely become quite adept at using some of the ad-hoc query and analysis tools; particularly with assistance such as training on the tools and data structures and a forum for the sharing of best practices amongst users, so as to help users see what is possible and translate it to a means to solve their own data access/analysis needs. Finally, the more that can be done to enable advanced users to write their own reports (including across multiple data sources or data sources that have been made “integrated” via data warehousing techniques), the more powerful our tools can be in supporting data-driven business decision making.

- Planning for future data access and analysis capabilities. There are also many emerging desires in this area, including the development of management dashboards, creating advanced financial reporting formats (e.g., school/department income statements), and implementing planning and forecasting capabilities and the ability to integrate planning and forecasting data with actual activity incurred in a time period. There are also desires to revisit the need for the archival of “snapshot” versions of reports and/or the use of “bursting” or other means to push reports to users rather than relying on them to pull the reports on an as-needed basis. Our data access strategy should provide a roadmap for these future capabilities.
IX. 3rd Party Software Implementation/Integration

A. Observations

For the purposes of this report, we are labeling applications other than the University’s standard systems for student administration, human resources, alumni relations/development, financial management, research administration, facilities management, and reporting – whether vendor-provided or custom-developed – as “3rd party software.” This working definition is not intended to slight any systems falling in this category; rather, it is a way to dedicate a portion of our report to a rapidly growing area of the University’s business systems environment. In reality, many of these systems are no less complex or critical than those on which we place the label “enterprise” systems.

The need for these 3rd party systems generally stems from one of the following reasons:

- Schools/units pursue their own 3rd party applications because it’s the most effective approach to meet their specialized needs
- Schools/units pursue their own 3rd party applications because the central system teams are not able to provide the desired features or functionality on the necessary timeline

Many of the 3rd party applications mentioned in the course of our interviews support the University’s student population in one form or another. For example, the Division of Student Affairs has implemented and supports over a dozen such applications, including critical systems used in support of housing, dining, student health services, and student organizations. Other examples are evident in the University’s graduate and professional school programs, where 3rd party applications are frequently used to “extend” the Student Enterprise System (SES). Given the importance of all of these applications – core SES and the 3rd party systems – the entire portfolio is relevant when we frame the issue of delivery of services to our students and faculty.

When these 3rd party applications are purchased from external vendors, the contract is often reviewed by staff in NUIT’s ITMS group (either because they are asked to do so by the purchasing unit or the Office of General Counsel). NUIT’s Information and Systems/Security Compliance (ISSC) group also participates in this review process as appropriate. This contract review process is a valuable service, often resulting in increased protection of the University’s interests, particularly the security of data and effective vendor management.

In the cases where these 3rd party applications are the result of in-house custom development, this work is often undertaken by groups affiliated with the entity that will use the system. For example, the Office for Research Information Systems (ORIS) has developed the Integrated Safety Information System (ISIS) to meet several of the unique needs of Northwestern’s research enterprise. Another party often involved in these custom development efforts is the McCormick School of Engineering and Applied Science. McCormick has historically been involved in the construction of systems that are largely school-facing in nature; in some cases, these systems have then been adopted by other schools or migrated to a central support model (e.g., GATS – Graduate Admissions Tracking System – is now managed by ITMS). While these school and unit-specific staff have the skills and resources to develop applications that meet their needs, everyone does not agree that this is the best way to operate. It has been suggested that standards and guidelines should be developed to ensure that any software or applications developed in-house meet certain expectations (e.g., data viewing, security vulnerability).
B. Considerations

With the increased volume of business systems offerings tailored to meet the needs of higher education business process, the recent proliferation of these 3rd party applications should be expected to continue. Many of these applications are offered in a hosted model and for a relatively low cost (both up-front and ongoing). While there are some risks inherent to increasing the number of products we are using and the adoption of hosted solutions, we are not suggesting that the use of 3rd party applications is a poor decision. Instead, we wish to point out that a strong process is needed to ensure that the solutions are selected, implemented, and supported in the robust manner necessary for the University to obtain the intended value. Several important aspects that this process should include are:

- Efficiency – the solutions chosen should be cost-effective and should not overlap with existing functionality in the University’s enterprise systems (assuming such functionality either meets the University’s needs or can be customized to do so with a reasonable effort level)

- Integration – the concept of a “standalone” system is essentially extinct; our assumption should be that we will be integrating these 3rd party systems with our core enterprise systems. Therefore, the systems chosen should be selected based on their ability to be integrated. Effort should also be allocated in our planning and prioritization efforts to tackle these integration projects

- Security/Compliance – in some cases, specific regulatory requirements must be met in these 3rd party applications in the same way that such mandates apply to our core enterprise systems. In all cases, the data stored in these applications must be protected against unauthorized access by both Northwestern users and external audiences

- Support – the solutions chosen should be accompanied with support from the vendor, including implementation assistance, training, customer support, and ongoing product development

The current practice of bringing groups such as ITMS, ISSC, and OGC together to ensure that 3rd party system acquisitions are done well should serve as the basis for a broader institution-wide consulting function. As stated above, the desire to acquire, implement, and integrate these 3rd party applications is likely to increase. Creating a strong, well-known vetting process and an open forum for the relevant parties from both central offices and the school/unit seeking the new solution is of paramount importance. It is critical that such an open forum be perceived as open to the best fit alternative, not simply biased towards recommending the lowest cost option or the product offering available through our existing software providers. By establishing such a process, we believe that a balance can be struck between supporting business needs while ensuring that security standards are met and maintaining data integrity and quality. This same service function could serve to evaluate whether in-house custom development is the most appropriate course of action in much the same fashion.
X. Security

A. Observations

Gaining access to the University’s enterprise systems generally requires the submission of a security form (there are exceptions, such as the self-service features of HRIS granted to all employees at their time of hire). Each system has its own security form; all forms are accessible online. The forms require the user to obtain varying levels of approvals. These forms are then submitted to the appropriate security administrator who performs the necessary setup tasks in each system. These forms can be complex, as most enterprise systems are set up to support users in many disparate “roles.” As a result, the individual requesting access to each system needs to possess a fair understanding of what type of access privileges to request. There are some cases in which the user’s “role” can be derived from attributes stored in the identity management system; however, most system access privileges are still controlled by the security roles in each enterprise system.

Most of the University’s enterprise systems also utilize some form of “row level” security, meaning data are locked down from a viewing standpoint to some extent. Typically, this access is granted by the equivalent of department or school, although it varies by system. The appropriate “row level” security is requested as part of the security form and is set up manually by each security administrator. If a user has uniform access to the same data across all systems, it is the result of independent setup in each system.

Restricting data access also leads to a great deal of complexity underneath the covers in the systems. For instance, the row-level security logic in NUFinancials requires several hours of processing time in the nightly data warehouse refresh to ensure that users’ access is correct each weekday. In SES, the complexity of the academic structure can be traced, at least in some cases, to data security requirements. The more complex the academic structure, the more effort must be invested when applying patches, performing upgrades, and tackling enhancements.

Once users obtain security privileges to access the University’s enterprise systems, they access the systems via multiple paths. Many, but not all, systems are accessible via the NUPortal. Many, but not all, systems utilize a single sign on (SSO) protocol. While most systems that do not use SSO authentication are secured via NetID and NetID password (thus one’s log-in credentials are the same each time), the lack of a single access protocol means that users can be prompted to re-authenticate (log in again) multiple times during the course of a day or when performing a cross-functional business process.

Sharing data between systems or between a transactional system and a reporting application is also a complex topic. Each system has one or more data stewards who must be consulted regarding the sharing of data from their systems. Several examples of this practice are evident in the 3rd party applications operated by Student Affairs. These systems frequently require data about current students that may be protected by FERPA regulations and, thus, requires signoff from one or more data stewards. Other examples, such as the use of NUFinancials, InfoEd, and SIMS data in the research space metrics data mart currently under construction are less restricted by privacy or other regulations, but still warrant careful review by data stewards so that data is not interpreted or secured differently across applications.
B. Considerations

Many users and several system owners voiced a desire to simplify the process of gaining/granting access to the University’s enterprise system. One avenue for doing so would be to pursue a role-based access policy to enterprise systems, reducing the need for security forms to be submitted for each system (the term role is used more broadly here – it represents a functional classification of a user’s responsibilities, not a system setting). This concept would require the development of a standard set of roles and provision a user’s rights according to these roles. It is reasonable to expect that this might work best for the commonly used components of each system; additional access would likely continue to require a request on an as-needed basis. Bringing the various security administration processes together may also lend itself to migration to a shared resource for processing all security forms across the enterprise systems.

Automation of the security request (and transfer/termination) process using electronic workflow might also be worth considering. Such an initiative might also lend itself well to the configuration of “groups” within the University’s identity management system. These groups could have utility in multiple facets, for example the ability to present role-specific content via an enterprise portal to a user or drive workflow approval rules in a standardized fashion across systems.

The University has no single data governance policy by which to guide security design efforts at a global level. In some cases, this omission has already posed hurdles to data integration efforts that had to be cleared in order to implement solutions that support University operations. As the University pursues additional initiatives aimed at providing access to integrated data, it is likely that a revisiting of our current “row level” security practices will be necessary. Else, reporting solutions may need to be either 1) restricted to access by a select few users that are authorized to “view all data,” 2) constructed using highly complex security logic that combines the row level security rules from each source system, or 3) developed and maintained using a separate security paradigm altogether.

Rather than wait for a project that requires a decision point such as that described above to hinder our ability to pursue new levels of data access and analysis, we recommend that a decision be made to broaden data access as much as possible. We recognize that there are sensitive data elements – payroll detail, data about individual students, data about individual donors, items such as faculty startup packages, etc. – so we recommend that the University consider what needs to be restricted and make the rest open to all users with access to the systems. With such a decision made, applications involving more sensitive data elements can be handled on an exception basis.

Consideration should also be given to the development of standard database “views” to which users can request access and use in 3rd party systems. We learned that the University of Wisconsin has had success with such an approach. In this sort of model, certain core, non-sensitive data elements are made available to system implementers that provide a valid business case for the consumption of this information.
XI. Business Process and System Training

A. Observations

Like other services, each enterprise system team provides its own training offerings to its user community. Though there are some exceptions, most training offered is done in an instructor-led mode, either in a training lab or auditorium. Most training materials are also available online via each system team’s website; however, very few courses are available as a true remote offering. While there are some collaborative efforts between system team training offerings and those of enterprise-wide groups such as Learning & Organizational Development, these instances are more the exception than the norm. It should also be noted that the number of dedicated training resources on most enterprise system teams is very few.

Although users expressed some confusion about where to learn about training offerings and register for and attend courses, their main suggestion for improvement was to deepen the content. Many individuals consulted voiced a desire to see training go beyond simply how to do a function in the system; they would like to receive contextual information about why and when to do the function, how to interpret and apply the results, etc. Advocacy to approach training by business function rather than system silo was evident. A particular area of stated need involves the financial management of sponsored projects, where the use of NUFinancials, InfoEd, HRIS, SES, and associated reporting from all three applications is necessary to ensure that an appropriate spending plan is in place and followed throughout the life cycle of the grant.

Support was also broadly voiced for assistance with training at employee onboarding, periodic refresher training (or recertification in areas where training is mandatory), and training support for business process changes (e.g., direct charging, effort reporting). Several users also commented that the leadership at all levels (including department chairs) needs to reinforce expectations that their staff will pursue training and continue their skill development.

B. Considerations

Very soon, all of the University’s enterprise systems will have completed their migration from legacy platforms to more easy-to-use, web-based platforms. This does not, however, mean that the demand for training services has been reduced to a bare-bones level. In fact, it may be higher than it has been in the past.

While it may be true that there will be relatively few initiatives that require the training of thousands of Northwestern constituents en masse, it is more accurate to state that the demand for training has evolved rather than diminished. Several stakeholders commented on the fact that the new systems contain more self-service functions, are more powerful (and thus more complex), and possess capabilities that many users either don’t know exist or don’t have the ability to get maximum benefit from. In parallel, it is becoming more broadly expected that training will be available to users anytime they need it, anywhere they are.

As this paradigm shifts (and, really, it already has in the variety of other online services that our faculty, staff and students use every day), we must rethink our approach. We should expect that the percentage of users that are willing to attend formal instructor-led training will decline. As we move forward, it will be imperative to offer training in multiple formats. We need a robust platform (perhaps a combination
of several integrated tools/modules) that will allow users to browse the offerings pertinent to their role, get registered for an offering in the mode of their preference, and, in many cases, complete the class right then, right there. There is also substantial demand to track training completion status as well as some measure of the user’s comprehension of the subject matter. Such a platform would be a critical tool in the support of compliance certification for research areas. It could also help all University audiences understand the learning that they should (or must) master to do their jobs well.

The University should consider aligning its enterprise systems training service providers and corresponding subject matter experts from the community so that they may work towards these cross-functional goals and develop their offerings using a common set of tools. This might be accomplished through a range of options, from creating a single group to creating a “virtual” team using a common approach, including dissemination of information via a single web presence, use of a single registration system, adoption of a standard format for training materials, etc.

As noted above, our training curriculum also needs an overhaul. Users need to be taught how to use our very powerful, if sometimes rather disparate, enterprise systems in conjunction with one another to tackle real business needs. How to access data both online and via reporting tools should be a major focus of this content. Course topics and content should not be constrained by the boundaries of systems or modules, but instead should be tailored to the commonly held roles of users throughout the Northwestern community – staff, faculty, students, alumni/volunteers, etc. The content should also address business processes and best practices in step with system elements. In this way, the approach should be one of consulting rather than just delivery, coaching the learners to meet their business needs in the most efficient and effective ways possible.
XII. Support/Help Desk

A. Observations

Each of the University’s core enterprise systems has its own help desk function. In some cases, there is more than one help desk because more than one system is supported by an individual team. Other independent help desks exist in specialized areas of the University (e.g., Office for Research) and many administrative offices – in both central and school areas – field an additional volume of direct support calls and inquiries, too.

In our conversations, users reported mixed reviews of the various help desks. Most were cited as very strong at answering basic inquiries – including support for how to process a transaction or troubleshoot system functions. Fewer were cited as being highly effective at assisting users with the underlying business purpose of the inquiry. The wide majority of users we consulted reported confusion about where help desk calls/emails should be directed. Some frustration was noted about handoffs from one group’s help desk to another’s. Many users also commented that they or their staffs also continue to call business offices, whether within schools or central, rather than the formal help desks established to provide the desired support.

Another observation is that several teams do not have dedicated first-tier help desk support resources. Instead, all calls are fielded by a business analyst or similarly skilled resource, resulting in a diminished capacity for those resources to perform their other job functions. The most well-resourced help desk supports the systems implemented by Project Café. In this model, all calls/emails are directed to a core group of six individuals in NUI-TSS (known as the Tier 2 team). While these resources perform other tasks, they are primarily dedicated to the support of the systems implemented by Project Café. If these individuals cannot resolve the inquiry, they are able to route the request to a Tier 3 resource within Café or several central offices. All incidents are logged and routed electronically in the IT Service Manager tool. A service level agreement (SLA) is in place, with agreed-upon standards related to response time and resolution rate. The SES team has plans to partner with NUI-TSS for its front line help desk support in the near future.

B. Considerations

Numerous stakeholders with whom we met during this initiative expressed support to migrate to a single central help desk. There is some hesitation to do so among system teams that have historically operated their own help desks. The primary concern voiced is that such a central unit is more likely to possess a “generalist” level of knowledge rather than deep expertise in every system function. This concern is also echoed by those users that advocate for the migration to a central model. Indeed, we must carefully weigh where to draw the line as it relates to what the help desk will be equipped to do versus when to contact a business office directly (in keeping with the parlance above, some items may need to go “directly to Tier 3”).

We believe that a central group could be effective in areas of general system support. This could include support for Macs, browser compatibility, known issues/outages, etc. It is also likely that they would possess the ability to resolve the large majority of inquiries (because they are, in fact, of a rather simple, repetitive nature), and provide a service that is lacking today by being aware of a broad range of systems, particularly their corresponding sets of recently launched features. With time and the investment of knowledge sharing, this group could also become well versed in more complex issues, and
serve as a highly valuable “feedback loop” into the further improvement and integration of the University’s enterprise systems. While this may require some patience during the learning curve, this process could be accelerated through standing meetings, sharing frequently asked questions with training providers, the use of knowledge repositories, and incorporation of help desk staff into the project lifecycle, for example as testers or students in a pilot training session. Such a model should increase the bandwidth for business analysts, etc. to work on those items that really do require their level of expertise, as well as spend more time on their project assignments.
XIII. Summary

As stated in the request from the Provost and the Senior Vice President for Business and Finance that we undertake this assessment, “Northwestern has reached a point at which it is now desirable to evaluate the development of a more cohesive University enterprise business systems strategy. In that way, the outstanding work that is already being conducted within each of the enterprise systems teams can be enhanced, and we can develop strategies for providing better service to the functional units across the University.”

As we consider Northwestern’s current enterprise business systems, the following conclusions are evident:

- We have (or in a few cases will do so very soon) implemented market-leading software applications for all of the enterprise system areas known as the main “pillars” within our industry – human resources, student administration, finance, research, and alumni/development. Within each “pillar” we are noteworthy among our peers in the breadth of functions or modules that we’ve implemented. The hard work and strong expertise of our staff that have worked on these implementations and subsequent initiatives are highly valuable assets to our University.

- Whether in the arena of making systems easier to use, data easier to access, or processes more efficient, the general consensus in the user community is that there is much left to be done. While we are reaping the benefits of our current systems versus their legacy counterparts, a significant potential for inefficiency and/or lack of capability persists. Needed improvements are often of a cross-system nature or relate to “infrastructure” elements of some sort – technical or procedural – and, as such, can be in competition with initiatives more fully confined to a single system’s purview. Many projects are “required” – often for regulatory or contractual reasons – and, thus, all of our attention must be split among these new initiatives and continuing to support and enhance our existing core enterprise systems.

- Given that we have been at work implementing our current enterprise systems for well over 15 years, it is not surprising that more than one model of organizing our teams, supporting our users, or even financing our investments has been employed. More striking is that, although the contrasts between the systems themselves are not inherently at issue, each enterprise system’s delivery model truly is distinct from the next. The persistence of these differences may be hindering our ability to continue to meet the demand described above in a resource-constrained environment.

The conclusions offered above and the various considerations presented in this report strongly support an integrated approach to our enterprise business systems, a concept that is also prevalent in the initial planning work undertaken by the ESSC over the past two years. We can no longer afford to take different approaches, in part because we are constrained by resource realities, but even more so due to the high degree of cross-system collaboration that many future initiatives will entail (e.g., integrated reporting and analysis, use of an enterprise business portal, document imaging, etc.). This need for an integrated approach is also in keeping with broader trends related to online services where the users of our systems expect – at their workplace and beyond – that solutions will be highly accessible, tightly integrated, and powerful enablers of management and decision-making.
Pursuing the considerations within this report will help the University to optimize its enterprise system functions, delivering positive outcomes for students, faculty, staff, and decision makers. This should not be perceived as a panacea of cost savings, however, as it may take several years (and perhaps investment in the short term) to realize the benefits of some of the ideas presented in this report. Strong leadership, particularly in the form of an integrated approach to prioritization and achievement of goals that are cross-system in nature, will be necessary throughout this process, enabling the University to balance its improvement goals with available resources.
Appendix A. Individuals Consulted During this Assessment

Elizabeth Adams, McCormick School of Engineering & Applied Science
Bill Banis, Student Affairs
Earl Barriffe, Medill School
Pam Beemer, Human Resources
Dan Blumenfeld, Audit & Advisory Services
Tom Board, NUIT-Cyberinfrastructure
Beth Bogdewic, The Graduate School
Dave Browdy, Feinberg School of Medicine
Betty Brugger, NUIT-ITMS
Deneen Bryce, McCormick School of Engineering & Applied Science
Coleen Coleman, School of Education & Social Policy
Jason Compton, Office of the Registrar
Rebecca Cooke, Feinberg School of Medicine
Paul Corona, Human Resources
Debbie Crimmins, Office for Institutional Research
Katie Dallia, Weinberg College of Arts & Sciences
Sheila Driscoll, Student Affairs
Ann Dronen, Student Enterprise Systems
John Ewan, Project Café
Alan Garbarino, Project Café
Simon Greenwald, The Graduate School
Cathy Grimsted, Weinberg College of Arts & Sciences
Kevin Grzyb, Facilities Management
Gisela Gutierrez, Kellogg School of Management
Dennis Hareza, Kellogg School of Management
Farhan Hasan, NUIT-ITMS
Regan Holt, Project Café
Jim Hurley, Office of Budget Planning & Analysis
Mary Jo Metz, McCormick School of Engineering & Applied Science
Angela Johanknect, NUIT-ITMS
Craig Johnson, Feinberg School of Medicine
Jake Julia, Office of Change Management
Andrea Kaapke, Northwestern Law
Alice Kelly, McCormick School of Engineering & Applied Science
David Keown, Kellogg School of Management
Leigha Kinnear, Human Resources
Maureen Knight-Burell, NUIT-ITMS
Amy Lammers, University Enrollment
Jon Lewis, Feinberg School of Medicine
Andrew Ludington, Office for Research
Rene Machado, Bienen School of Music
Patricia Mann, The Graduate School
Aaron Mansfield, NUIT-TSS
Patrick Martin, Office of the Registrar
Paul Matijevic, Office of Alumni Relations & Development
Marsha McClellan, Feinberg School of Medicine
Meg McDonald, Office for Research
Betty McPhilimy, Audit & Advisory Services
Bob McQuinn, Office of Alumni Relations & Development
Lisa Metzger-Mugg, The Graduate School
Mike Mills, University Enrollment
Rick Morris, School of Communication
Ron Nayler, Facilities Management
Aaron Parks, Audit & Advisory Services
Kalpesh Patel, NUIT-ITMS
Moses Phenany, Project Café
Luna Rajbhandari, NUIT-BI Solutions
Lois Remeikis, Northwestern Law
Jim Roberts, Student Affairs
Jeannine Russo, School of Continuing Studies
Harry Samuels, NUIT-ITMS
Michael Satut, NUIT-TSS
Liz Schaps, Facilities Management
Jean Shedd, Office of the Provost
Jeff Smith, Bienen School of Music
Ingrid Stafford, Financial Operations
Alexa Starr, Kellogg School of Management
Gene Sunshine, Senior VP, Business & Finance
Dave Takehara, Financial Operations
Gretchen Talbot, Weinberg College of Arts & Sciences
Kathy Tessendorf, Human Resource Information Systems
Tim Tiernan, NUIT-ITMS
Mary Tobin, Office for Research
Pat Todus, NUIT
Doug Troutman, Medill School
Karl Turro, Financial Operations
Kate Veraldi, The Graduate School
Dan Volocyk, Office of Research Information Systems
Warren Wallace, Feinberg School of Medicine
Paul Weller, Facilities Management
Appendix B. Lists of Standard Questions

To ensure a reasonable degree of comparability in the discussions held during the assessment process, we utilized a standard set of questions. Two sets of questions were used, with those for the enterprise system managers/directors being more detailed in nature than those posed to the school unit representatives. Both sets of questions are below.

Questions for enterprise System managers/directors

1. Discuss 2-3 recent successes that your team has had
   a. How do you measure this success (e.g., surveys, informal feedback, ROI, etc.)?
   b. What were some of the key factors that led to this success?
   c. Any takeaways that you will apply to future initiatives?
2. In what areas would you like to see your team improve? What would enable such improvements to occur?
   a. If additional staffing cited as need, in what capacity (what skills, roles, quantity)?
   b. If implementation of new technologies cited, which ones? When slated for implementation, if at all?
3. What other groups is your team dependent on as it relates to the successful delivery of your systems?
   a. How would you assess the current state of those relationships?
   b. If less than optimal, what could improve the relationships?
4. What about enterprise systems in general – what could be improved?
5. Are there any functions that your team provides that you believe could/should be provided by another unit (e.g., schools, other system teams, other central groups)?
   a. If so, explain
      i. Resources required to do so
      ii. Impact of not pursuing change(s)
6. Are there any functions that are provided by other units that you believe could/should be provided by your team?
   a. If so, explain
      i. Resources required to do so
      ii. Impact of not pursuing change(s)
7. Are there any common questions/requests/complaints voiced by your users?
   a. Are there current solutions to these items? Plans to address them in the future?
8. What is your team’s current and planned use of Cognos as University’s standard reporting tool?
9. What is your team’s planned use of new enterprise-wide portal?
10. What emerging needs do you see in the community/industry? Any plans to react to these emerging topics?
11. Describe the major projects on your team’s plate for the next 2 years
    a. Are projects approved?
    b. Are projects staffed/funded appropriately?
12. Closing:
    a. Any individuals/units that you would recommend we speak with as part of this initiative?
    b. Any other institutions that you see as a leader in your system area? In enterprise systems in general?
    c. Ways we can be of assistance to you in this initiative?
Questions for school/unit representatives

1. Can you provide some examples in the area of enterprise systems that are going well from your perspective (e.g., projects, services, interactions)?

2. With regards to enterprise systems at NU, what, in your opinion, could be improved?
   a. Do you have a sense of what it might take to achieve such improvements?
   b. Do you have any specific recommendations you’d like to share?

3. Are there any common questions/requests/complaints related to enterprise systems voiced by your colleagues/staff?
   a. Are you aware of current solutions to these items? Plans to address them in the future?

4. How do you think NU is doing in terms of where the work gets done with regards to enterprise systems? Would you suggest any changes in where functions reside?

5. With regards to enterprise systems at NU, are there any questions you’ve always wondered about that we might be able to clarify as part of our effort?

6. Closing:
   a. Any individuals/units that you would recommend we speak with as part of this initiative?
   b. Any other institutions that you see as a leader in the enterprise systems area?
   c. Ways we can be of assistance to you in this initiative?