Program Summary

This program provides software development and application support for vendor-purchased and in-house-developed applications. Features include: reviewing software needs, designing and developing custom solutions, performing security reviews, implementing database and authentication solutions, recommending hardware and software configurations, installing and configuring applications, and troubleshooting and resolving incidents according to established service level targets.

DoIT supports more than 30 vendor-purchased applications including: AIMS (Parking), Cascade Server (web content management), Mercury (Housing), NIU Calendar, and Ungerboeck Event Management (Outreach). DoIT also supports over 40 custom in-house-developed applications including Apply to NIU (Admissions), NIU Directory, NIU Shopping Cart, and Scholarship Finder.

With over 70 applications and only 6 application support staff, each of these important applications receives less than 10% of a developer’s time.

Criterion 1: Importance to University Mission / Operations

Importance to Mission

For the most part, these applications are foundational to the university’s business processes, but are not directly part of the academic mission of teaching and learning. These mid-sized division-class applications support NIU’s websites, events, calendars, and basic document processing support the mission-critical business and academic offices, but are not in and of themselves aligned with the academic mission. Like the management of the larger enterprise-class academic and business applications, centralizing the customization and development of these mid-sized applications assures that applications are consistently developed and supported to be easier to use, more efficient to support, ready and able to share data with other applications, and built to withstand security requirements.

Importance to Operations

These services provide the underlying support for university’s business operations, enabling the university to focus on creating strong academic programs and an enriching student experience. These tools give faculty, staff and students the flexibility and and ensure the efficiencies that allow them to better perform their foundational job duties. Retaining the ability to provide custom, in-house development allows departments to tailor solutions to meet their specific needs instead of purchasing more expensive products that might still require a considerable amount of customization and configuration.

Program Portfolio

Because employees require cost-effective and secure technologies to drive their operations and efficiencies and students rely on technology to help navigate their academic experience, this central development resource remains a critical supporting program. Without a centralized development resource on campus, individual areas would find ways to support or develop their own individually-purchased applications. This leads to inefficient, redundant and expensive practices that rely on disjointed support models, creates security risks and support vulnerabilities across the institution.
Program Synergy

This program relies on close relationships, interactions and in-depth knowledge of business practices within many campus departments. DoIT staff work as both application developers and business analysts to understand the ongoing business and operational needs and create highly effective and efficient solutions. For example, DoIT works closely with Marketing and Communications in supporting Cascade Server, the web content management solution that serves over 300,000 web pages for the institution. Through a mutual understanding of each other’s roles and strengths, we, as partners, effectively and efficiently both support and use this application to provide a vital resource and front door to our students, faculty, staff, community, and alumni. Without DoIT, the Marketing and Communications staff would need to provide their own infrastructure and support that would shift focus away from their core creative competency.

Moreover, these applications interconnect with the Student Administrative System and Identity and Access Control to provide automated deployment of tools and a seamless and consistent user experience throughout the employee and student account lifecycles.

Criterion 2: Quality / Effectiveness

Functions and Services

This program provides software development and application support to academic and administrative departments for vendor-purchased and in-house-developed applications. Support includes: reviewing software needs, designing and developing custom solutions, performing security reviews, implementing database and authentication solutions, recommending hardware and software configurations, installing and configuring applications, and troubleshooting and resolving incidents according to established service level targets. We currently support over 30 vendor purchased applications as well as over 40 custom in-house-developed applications. These range from billing systems to event management to undergraduate admissions applications to campus emergency notifications to the central web content management system.

However, demand for custom application development has dropped as campus budgets have been slashed. The need for updated technologies to work with always-updating hardware and software remains strong, but cash-poor departments are forced to stick with aging systems that don’t make use of mobile technologies and may be non-compliant with new data security requirements.

Measures of Quality

1. System availability is measured against both planned and unplanned downtime.
2. Mean Time to Resolve (MTTR) measured by the time between the reporting and the resolution of an incident
3. Number of incidents per application
4. Development of new (especially mobile) releases for custom applications.

Evidence of Quality

1. Redundancy is built into the hardware architecture for these applications. Over the past four years, there has only been one unscheduled outage. Annual uptime is more than 99.9% for this environment which hosts nearly all NIU web sites and custom web applications.
2. Mean Time to Resolve incidents is just under 7 calendar days in the current fiscal year, but 65% of those incidents are resolved within a 24-hour period. We have not met our internal standard for quality, 3 days, because we have lost 50% of the staff who support this service.

![Mean Time (Hours) to Resolve Incidents: FY16](chart)

3. Most supported applications run smoothly with very few incidents reported. In FY16, the Pinnacle system used to manage telephone inventory and billing for the entire campus underwent a difficult software upgrade that resulted in ongoing and lengthy incidents that required extensive vendor intervention.

4. As new applications are developed and updated, the latest development frameworks for state of the art mobile and web delivery are utilized.

**Quality Improvement**

DoIT staff regularly perform server and infrastructure refreshes, upgrades, and expansions of the web server environment to keep up with demand for the services offered and to provide the latest in industry technologies. As mobile devices have become more predominate, DoIT staff are training to develop mobile web applications. This program is committed to continuous service improvement and achieving a high standard of support per staff FTE.

- Even before users might notice a problem, automated alerts are generated when service components are slow or non-responsive. These alerts are not present on all 70+ applications, but DoIT is committed to increasing the number of services, applications and components that are actively monitored.
- User-reported incidents are actively managed to ensure timely resolutions.
- Staff work closely with functional users to ensure that business needs are understood and met.

**Criterion 3: Productivity / Efficiency**

**Scope of Program**

DoIT staff provide all of the technical support and development for the 70+ applications owned by various campus departments. Support and development includes application software and patch installation, coordination of functional testing of all software releases, troubleshooting functional and technical problems with systems, design and development of interfaces between systems, and communication with vendor support. In addition, the Service Desk provides first- and second-tier customer support that includes basic troubleshooting and request fulfillment.

The supported applications run on more than 20 servers. These complex and disparate systems required a wide breadth of knowledge to properly support a variety of hardware requirements and software support skills. For
example, each vendor application has unique requirements for supported web technologies, server and desktop hardware, operating systems, provided interface methods, software runtime engines, and networking configurations.

This program also supports the infrastructure and foundational software for the NIU web presence of more than 500 websites and 1,000 content creators. DoIT provides and supports both development and custom tools for the Cascade Server platform: the industry leader in robust and professional web content management.

Productivity Comparison

DoIT currently charges $50/hour for application development. Research online suggests similar development costs range from $55/hour to $300/hour, based on developer skill and experience as well as functional, technical and security requirements.

Resource Comparison

DoIT has less than minimal staff coverage and will need to shrink the portfolio of apps provided. At current levels, we cannot provide sufficient cross-training to protect against the risk of staff attrition. The math indicates each person can spend one hour per week tending to each application, which does not meet the minimum professional standard of involvement. In this regard, we are below all known peers. DoIT is also unable to devote sufficient time and attention to developing mobile apps for the campus and is understaffed for mobilizing existing apps, again lagging most peer institutions.

Only 7.5 FTE currently provide the support and development for these 70+ applications, down by 50% since 2011. Just over .1 FTE support each application, right at one hour each week. Required application upgrades and enhancements must often wait. Without backup staff trained and available, some applications are at complete risk of failure and non-support.

Cost and Revenues

Despite the unwanted 50% reduction in support staff, DoIT has moved most of the physical servers into the virtual server environment. These actions have drastically reduced program costs over the past three years. As DoIT’s internal costs have diminished, these savings have been passed on to NIU customers.

Criterion 4: Internal & External Demand

External Demand

This program directly supports the Division of Outreach, Engagement, and Regional Development. The Ungerboeck application provides tools for event management, registration, membership management, and reporting. Other external-facing services include the NIU Motorcycle Safety project, English Honor Society, and Conference Services.
Internal Demand

As the central resource on campus for application hosting, custom web development, and support, DoIT provides these key services to nearly every department on campus. Internal demand for new development at $50/year has dropped off precipitously with the reduction in departmental budgets.

Criterion 5: Opportunity Analysis

Cost Savings Opportunities

As the central provider for application development and hosting, we have always been focused on reducing costs for campus. This had been done by providing a professional team of developers and application support personnel who can provide services at an attractive price. This eliminates the need for departments to hire their own developers and staff to write and support applications on their own hardware.

5.2 Future Revenue / Resources

With the reduction to staff that we have absorbed over the past three years, we have no capacity to provide additional resources who could generate additional revenue. Without additional funding, we can only provide resources to maintain our current operations while taking on minimal new work.

Improvement Opportunities

While no single application in this service warrants the development of a centralized QA team, the university could benefit from such a program. Not only are central functional offices such as HR and Purchasing unable to provide full and complete software testing during upgrade cycles -- leading to difficulty in keeping up with vendor provided feature releases -- these second tier applications often have no formalized test plan at all. A QA team could serve PeopleSoft as well as these second tier apps, providing relief for functional offices and bringing back into balance a professional standard of staffing and application management for these 70 apps that are critical to departments or divisions across campus.

Opportunities in the Field

The best emerging practices in this area involve the custom development of mobile apps rather than some new way to manage the second tier systems like Titanium or Cascade. NIU could, with minimal cost, develop a cadre of student developers and give them prominent space in HSC or the Library where they could emulate a small startup or incubator focused on developing niche mobile apps for professors or small departments. Through paid internships, students receive marketable skills and we have a greater supply of contemporary mobile apps that solve real research or administrative needs. One near peer, Ball State, features their version of this program during their Admissions tour.