Small Carrots, No Sticks: Engaging Campus Business Partners in the Design and Deployment of New Enterprise Services in a Decentralized Campus Environment

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ABSTRACT

During a single academic year, Carnegie Mellon University Libraries' Digital Strategy team launched two major IT service offerings in support of university-wide strategic initiatives: A new Integrated Library System (ILS) and an Enterprise Research Information Management System. The former replaces the operational heart of the library; the latter positions the library at the center of the research enterprise at Carnegie Mellon, introducing Libraries to entirely new and demanding customers and partners. We outline the challenges of engaging campus business partners in a remarkably decentralized environment and present strategies and tactics used by the Library IT project and service managers to facilitate successful service launches. This includes a review of approaches to engagement and timeline management with campus customers and data providers, vendor management tactics, and evolving efforts to foster support for our services and associated projects.

CCS CONCEPTS

- Applied computing → Education → Digital libraries and archives

KEYWORDS

Service Design; Service Transition; Library IT

1 INTRODUCTION

The University Libraries at Carnegie Mellon University (CMU) is positioned as "...an essential academic partner, whose services, expertise, and collections are at the heart of the work of CMU." [1] As part of its mission, the University Libraries is committed to strengthening CMU's academic community by actively supporting teaching, learning, and research efforts throughout campus. CMU Libraries' Digital Strategy team supports this mission by assuming responsibility for the strategic planning, implementation, and support of all mission-critical library IT systems and related services.

Recently, the Digital Strategy team launched two major IT projects designed to create and enhance services that support university-wide strategic initiatives: A new Integrated Library System and an Enterprise Research Information Management System. The former replaces the operational heart of the library; the latter positions the library at the center of the research enterprise at Carnegie Mellon, introducing Libraries to a new set of customers and partners, each with their own pitfalls and demands. This paper will outline the challenges of engaging campus business partners in a remarkably decentralized environment, and present strategies and tactics used by the Library IT project and service managers to facilitate successful service launches.

2 BACKGROUND

2.1 New ILS

The CMU Libraries decided to explore replacing its Integrated Library System (ILS) because the ILS in use was over 20 years old. Because of the libraries' rapidly evolving needs, this system had become antiquated, and was adversely affecting productivity. Furthermore, in the decades since its implementation, newer advanced library systems demonstrated the ability to improve workflow efficiencies with enhancements such as the ability to integrate with third party products and applications.

The project team included members from several functional areas of the library who had expertise in particular modules and interfaces of the current ILS. The team began with the goal of evaluating whether newer ILS systems would allow for a more

integrated approach to library system management. The team focused on solutions that would streamline processes, improve workflow efficiencies, and improve integration with other library systems such as institutional repositories and research data management systems. A Request for Proposals (RFP) was drafted to aid in determining whether the libraries' needs could be better served by implementing another ILS. If the ILS project team determined that the best solution included implementing a new ILS, the team would recommend the preferred system among the submitted proposals. If we concluded that none of the proposed systems provided a better solution than the current ILS, we would present that recommendation with supporting evidence.

The project team distributed an RFP to ILS vendors who serve academic institutions. Vendors were given a deadline to submit their proposals. After reviewing the proposals, the project team invited 2 vendors for on-campus presentations of their ILS solutions. After the completion of the vendor presentations, the project team recommended a solution to library leadership.

2.2 Enterprise Research Information Management System

In early 2017, the senior leadership at CMU agreed to enter into a strategic development partnership with Digital Science, a technology company that provides tools to the scientific and research communities at key points along the research lifecycle. Included in the Digital Science ecosystem of tools is Elements, an Enterprise Research Information Management System (Research IMS) built by the Digital Science portfolio company, Symplectic. The system is a centralized information source for the scholarly activity of campus faculty and research staff, including publication references, teaching activity, grants data, and other scholarly activity. Each faculty member and research staff person is given an account on the system that enables them to add scholarly activity records to their Elements profile. The following quote from a joint press release, issued by CMU and Digital Science, highlights the vision that drove the project.

> "By implementing a suite of products from the Digital Science portfolio, Carnegie Mellon will unveil a solution to capture, analyze and showcase its leading research. Using continuous, automated capture of data from multiple internal and external sources, including publication and associated citation and altmetrics data, grant data, and research data, Carnegie Mellon will be able to provide its faculty, funders and decision-makers with an accurate, timely and holistic picture of the institution's research."[2]

Given the Libraries' mission to actively support teaching, learning, and research efforts throughout campus and its inherently central position within CMU's academic ecosystem, the CMU Libraries was chosen to house and support the new Research IMS service. A product launch team was formed with Libraries team members. The launch team devised a plan to introduce the Research IMS to campus using an incremental strategy. First, the team secured support from the provost's

office, the office of institutional research, and the college deans. Each dean agreed to encourage the use of the system as a key part of their college's annual review processes. The team then conducted two concurrent pilots of the system during one spring semester. Both pilot efforts used the Research IMS as a tool to help facilitate faculty annual review processes. The first pilot was conducted within the University Libraries itself, where librarians hold faculty appointments. The second pilot was conducted with the Information Science department within the College of Humanities and Social Science. Once the pilots were complete, the team documented lessons learned and then developed and executed a college-by-college rollout strategy.

3 CHALLENGES TO SUCCESS

A significant challenge to the successful launch of both systems was CMU's organizational structure. The current day CMU is the result of the 1967 merger between two academic institutions: The Carnegie Institute of Technology and The Mellon Institute. In order to capitalize on the individual strengths and institutional knowledge of each contributing college, of which there are now eight, the university continues to foster a culture of independence at the college level. As a result, the university environment often operates in a remarkably decentralized fashion – at times behaving more like a confederation of autonomous colleges and schools connected by a central administration. This arrangement sometimes leads to substantial differences in the policies, procedures, and common practices among the different colleges.

An additional challenge was the size of the Digital Strategy team. For the duration of both implementation projects, the Digital Strategy group had 7-8 FTE staff, including the director. These staff members were responsible for all library IT operations and development for the libraries in addition to performing technical support functions for other projects. As a result, the respective project teams had to be mindful of the fact that there were a limited number of IT staff person-hours that could be allocated to each of the service launch efforts.

In an attempt to mitigate the challenges associated with engaging critical parties in such a decentralized heterogeneous environment, the University Libraries Digital Strategy team identified an engagement strategy with three basic components:

1. Identify internal and external business partners
2. Align project timelines with campus business partners and coordinate with campus data providers
3. Engage with and manage third-party vendors

This paper will include an overview of each component of this engagement strategy and will examine the role that they played in the Digital Strategy team's overall service transition, planning, and support processes.

4 ENGAGEMENT STRATEGY

4.1 Identify Internal and External Business Partners

The first step of engagement is to identify key campus business partners that are both internal and external to library operations staff. Generally, these business partners include campus data providers, central IT, and administration staff from the individual colleges.   However, senior-level project champions must be engaged as well.

To be clear, this process goes beyond merely identifying the team or department with which one needs to engage. One must identify and engage relevant individuals. From the project manager's perspective, this is not necessarily as easy as it sounds. Although the project manager is armed with some level of authority, a project team is often comprised of members over whom the project manager has little to no actual authority. This dynamic is even more challenging when engaging with internal and external business partners. Often it becomes necessary to have the project manager's supervisor engage with the department heads of the individuals whose participation is needed for a project to successfully produce its desired deliverable(s). This type of engagement will help everyone understand their role in the project while respecting the chains of command in the organizations and departments that are part of the project.

The ILS and Research IMS had separate yet overlapping sets of key campus business partners that were identified in step one of the engagement strategy.

4.1.1 ILS Campus Business Partners

The ILS project team identified three key campus business partners:

1. Central IT
2. Business Operations
3. The Bursar's Office

The Central IT department manages the HR information systems that contain the university personnel data used for ILS system user account feeds as well as identity management services for the ILS system.   The Business Operations department manages Oracle Financials, an important data source for the ILS that helps the library to track spending on library assets. Finally, the ILS integrates with systems from the Bursar's Office to track personal information such as student account information and library fines.

4.1.2 Research IMS Campus Business Partners

The Research IMS implementation team identified five key campus business partners:

1. Central IT
2. Provost's Office
3. College Deans and Department Heads
4. Institutional Research Office
5. University Libraries Management

As with the ILS, the Central IT department manages the HR information systems that contain the university personnel data used for Research IMS system user account feeds as well as identity management services for the Research IMS.   The Research IMS project was sponsored by the Provost's Office. Hence, the support of this office was paramount in influencing other campus entities to engage with the project effort. In order to promote system adoption by faculty campus-wide, the project team decided to engage college deans and department heads to encourage the use of the system as a tool to help facilitate annual faculty review processes. Upon implementation, the data housed in the Research IMS could be a rich source of information for the Institutional Research Office.   Therefore, engaging this office to convince them of the system's value was integral to the system's overall adoption. Finally, the University Libraries' management team served as a champion for the effort with the colleges and the office of institutional research.

4.2 Align Project Timelines with Campus Business Partners/Coordinate With Campus Data Providers

The implementation of the Integrated Library System and the Enterprise Research Information Management System relied heavily on campus business partners external to the University Libraries for data feeds and other IT system integration support. This is common for many IT systems and services that fall under the Digital Strategy purview.   The campus business partners involved with Digital Strategy's projects simultaneously support other campus activities and, therefore, must allocate resources to other efforts. Therefore, it is critical to align project timelines with the priorities of the other campus business partners.

It is also important to specifically define and outline the division of labor between the project team and the campus business partners. For example, the ILS project team worked with Central IT to provide user data feeds to the ILS. The vendor required these feeds to be in a particular format. The team assumed that it was enough to provide these data specifications to the data providers. However, because of the level of configuration required, the data providers could not do this work in the required timeframe. As a result, the burden shifted to the project team who had to expend already limited resources to complete this task.

Each new system required some level of data integration with existing campus systems. Generally, the newly implemented system consumed data from existing campus systems via pre-processed data feed or directly via RESTful API.

In step two of the engagement process, the ILS and Research IMS engaged the following sets of campus data providers.

4.2.1 ILS Data Providers

1. Human Resources
2. Central Computing Services (Enrollment Services)

The Human Resources office provided the personnel data needed to create user accounts for the ILS. Enrollment Services provided student enrollment data, which is used to help determine user access to specific library resources.

4.2.2 Research IMS Data Providers

1. Human Resources
2. Registrar
3. Vice President of Research

The Human Resources office provided the personnel data needed to create user accounts for the Research IMS. The Registrar's office provided course information data to the system for faculty teaching records. The Vice President of Research's office provided data related to grants applied for and awarded. All of these data sources provide information that contributes to the utility and comprehensiveness of the Research IMS.

4.3 Engage With and Manage Third-Party Vendors

There are a number of third-party vendors that provide products and services that enable both systems to provide maximum benefits to their respective users. Effective coordination with these vendors was a paramount concern. Below are the vendors associated with each project.

4.3.1 ILS Project Third-Party Vendors

1. Ex Libris (library catalog and discovery)
2. Relais (PALCI E-ZBorrow Inter-library loan)
3. ILLiad (Inter-library loan)
4. Various electronic database vendors

The ILS project team unanimously selected Ex Libris' Alma (library catalog) and Primo (discovery platform) as the ILS solution. Library leadership accepted the team's recommendation and the pre-implementation phase of the project began. The team labored to finalize the configuration of the Alma and Primo production environments and members of the Digital Strategy IT team worked with their Ex Libris counterparts to extract data from the old ILS and submit it to Ex Libris in the format specified. The team completed the migration after multiple data extractions and several rounds of discussion with the vendor.

Relais is the company that The Pennsylvania Academic Library Consortium, Inc. (PALCI) uses to facilitate inter-library loan service to institutions within Pennsylvania. Prior to go-live for the new ILS the team notified Relais of the library's migration to a new ILS. The key was to reach out to them early in the process. Relais and Ex Libris were able exchange system requirements through the project team and as a result of this early engagement the E-ZBorrow inter-library loan service was uninterrupted.

ILLiad also provides inter-library loan services which includes books as well as article delivery. Since ILLiad is a more isolated system, this integration was more straightforward than others. The team configured the new ILS to connect to ILLiad as per ILLiad's specifications and aside from minor configuration tweaks, the integration worked nearly flawlessly.

Engaging with the numerous electronic database vendors was very time consuming. Each vendor had to be contacted individually and notified of the switch to the new ILS so that the link resolver URL could be updated. This was such an enormous task that the process continued beyond go-live. For contractual reasons, this had to be completed by the time the contract expired with the vendor of the previous link resolver.

4.3.2 Research IMS Third-Party Vendors

1. Symplectic
2. Digital Science
3. Other Digital Science Portfolio Companies
   a. Altmetric
   b. Figshare
   c. Dimensions
4. Digital Measures
5. Gap Technologies, Inc./SmartEvals
6. Author Identifier Management Organizations
   a. ORCID, Inc.
   b. Scopus
   c. Thompson Reuters/ResearcherID

Symplectic is the developer of the Research IMS, Elements. CMU is engaged in a strategic development partnership with Symplectic's parent company, Digital Science. As part of the development partnership agreement, Digital Science provided strategic planning, implementation, and system integration support throughout the Research IMS implementation.

In addition to Elements, CMU adopted products from three other Digital Science portfolio companies. These products included: Altmetric, a tool that measures alternative metrics for a research publication's reach and community impact; Figshare, a research data repository and institutional repository tool; and Dimensions, a research grant tracking system. The implementation team integrated the Research IMS, to some degree, with all three of these auxiliary systems.

Digital Measures is a legacy system for research publication data and faculty annual review processes that is used by some colleges and departments across CMU. The implementation team had to engage with Digital Measures systems to develop data migration plans for those organizations that used Digital Measures.

SmartEvals is a third-party information system, developed by Gap Technologies, that is used to collect and house faculty course evaluation data for faculty at CMU. The implementation team had to work with the Gap Technologies support team to secure a faculty course evaluation data feed used to populate teaching evaluation data for faculty profiles within the Research IMS.

Author identifiers are unique identifiers that enable researchers to unambiguously associate themselves with their published research outputs. The Elements system allows a researcher to associate his or her ORCiD, Scopus ID, and ResearcherID author identifiers with his or her system profile. These identifiers are used by the system to "auto-claim" publication records for the researcher. That is, the system uses the researcher's author identifiers to search multiple research publication databases, through an automated process, and links a researcher's publication records to the researcher's system profile. ORCID, Inc., Scopus, and Thompson Reuters provide services that assign and manage the ORCiD, Scopus ID, and ResearcherID author identifiers, respectively. The implementation team was responsible for ensuring that the three author identifier management platforms were fully integrated with Elements.

5 PROJECT OUTCOMES

5.1 Integrated Library System

The library successfully migrated to a new Integrated Library System. The organization was able to use this opportunity to update workflows and streamline processes. As a result, the end user experience has improved and will continue to improve, and staff productivity is rising as staff members become more familiar with the new ILS.

5.2 Enterprise Research Information Management System

At the time of this writing the project team had completed the system implementation phase of the Enterprise Research Information Management System. This implementation includes research publication data, teaching data, and faculty assessment modules. Two different academic units have completed one full cycle of faculty annual reviews using the Research IMS as a central tool in their respective processes. Two more academic units are scheduled to use the system as a tool in annual review processes in the upcoming fall term. Qualitative feedback from both faculty and administrators has been positive and users report that the system helps to simplify the annual review process. Comprehensive user engagement plans are in place for the rest of campus. Based on the feedback received from pilot users, confidence is high that the system will be broadly adopted across campus.

6 LESSONS LEARNED

After conducting the respective post-mortem analyses for both efforts, two primary lessons learned emerged.

1. Engage early and often with business partners.
2. Be as specific as possible regarding timelines and divisions of labor.

By engaging business partners early in the process, the project team is able to set expectations with respect to scheduling issues, access to shared campus resources, and project prioritization. Remaining engaged with business partners throughout the process helps the project team to stay abreast of changes in the campus environment that may affect the project's success. Furthermore, when the team's success is dependent upon other campus entities, project managers should establish and document specific agreements with business partners to ensure that there is a common understanding of what data and/or other information the business partners are to provide and when they will provide them.

7 CONCLUSION

On many university campuses, the demands of normal campus operations combined with those of special campus initiatives force university IT units to manage the development and delivery of multiple services in various stages of the IT service management lifecycle. Often, concurrent projects compete with one another for prioritization, staffing resources, and access to shared resources within a department and throughout campus. This paper presented a case study that examines the challenges the CMU Libraries Digital Strategy team faced when asked to execute two concurrent projects with the goal of launching two different IT services. The need for a new Integrated Library System was identified through an internal process within the University Libraries and this system supports essential library operations processes. In contrast, top-level university administrators identified the need for a new Enterprise Research Information Management System to act as a campus-wide clearinghouse for tracking academic productivity and they determined that the University Libraries should be responsible for its implementation and management. Given these two separate and distinct mandates, the Digital Strategy team identified steps for engaging campus business partners in the notably decentralized environment of Carnegie Mellon University's campus while effectively managing limited IT staffing resources. The implementation teams attribute the success of both service implementations to following a three-step engagement strategy:

1. Identify internal and external business partners
2. Align project timelines with campus business partners and coordinate with campus data providers
3. Engage with and manage third-party vendors

One may conclude that implementing a similar engagement strategy will yield success when approaching multiple service implementations in comparable environments.

REFERENCES

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