Printing and digital archiving team

Report

March 11, 2011

"The Institute-wide Planning Task Force was the centerpiece of efforts across campus to conceive of new ways to operate and advance the MIT mission. A significant theme emerging from the Task Force effort is the overall need for MIT to modernize its administrative systems and processes and to work toward a largely digital MIT." – Israel Ruiz

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Cover quote from May 2010 letter to the community from Vice President for Finance Israel Ruiz.
http://vpf.mit.edu/site/digital_mit_turning_a_concept_into_a_reality

Charge to the team

The Printing & Digital Archiving Team was formed in June 2010 to build on some of the recommendations of the IT@MIT and the Administrative Process Working Groups of the MIT Institute-wide Planning Task Force. This group was asked to continue to work on the area of infrastructure to enable effective printing strategies and reduce costs and distribution of printed materials, develop record retention policies, and pursue electronic storage systems to enable the elimination of paper records and archives.

The charge to the team included the following areas of focus:

1. Best practices
2. Guidelines for document retention
3. Appropriate tools and technology
4. Desktop printing reduction and management
5. Prioritization of ideas for process simplification

Background and context

The work of continuously improving and simplifying administrative processes that affect faculty, students and staff at MIT has gained considerable momentum from the work of the Institute-wide Planning Task Force Working Groups and the MIT Idea Bank.

The past year has seen the completion of several projects aimed at removing process pain points, while at the same time increasing the footprint of *Digital MIT*. This work has aimed at increasing efficiency and productivity, particularly in the administrative processes of MIT, and contributing to reducing paper use across campus. *Examples include:* Electronic W2's and paystubs, online Request for Payments, Appointment Process Redesign, Travel Modernization, paperless Undergraduate Admissions, paperless International Student Office processes and electronic transcripts.

IS&T has developed roadmaps collaboratively with relevant sponsors and business units. IT Roadmaps approved to date by the IT Governance Committee are: Data Management, Network Security, Education Systems, and Mobile Computing. The Administrative Systems roadmap is under development. These planning documents will form the backdrop and guide the implementation of future Digital MIT projects. As a steady stream of projects continue to be readied for implementation, they should also be guided by the needs of departments, labs and centers (DLCs) and the vision of the MIT Campus Energy Task Force to reduce paper use and promote smart printing.

Data explosion!

In addition to the *transactional* information that supports administrative processes, we are seeing an increasingly *collaborative* aspect to our work, reflective of MIT's global initiatives around teaching and research and characterized by a need to access content from anywhere, anytime and in any format. Collaboration within and between DLCs, with government agencies and with external collaborators has become a key aspect of daily work.

These documents often reside locally impeding the ability to share, version, search or preserve them easily. They also impose a burden on local physical and data storage resources. The result has been a *quantum increase in structured and unstructured content*.

The challenge is to manage this explosion of data.

In addition to the data being generated from Digital MIT projects, MIT Libraries has a vast array of digital assets that require data management and infrastructure support.
See Appendix 2 for a list of Libraries' data assets.

*Examples of **structured data**: Department of Facilities Space Inventory database, MIT Data Warehouse.*

*Examples of **unstructured data**: Resumes in MS Word Format, Excel documents, PDF files, tiff and jpeg images, Departmental project documents associated with project management applications, meeting agendas, minutes stored in wikis.*

Reference Appendix 1 Glossary for explanation of terms.

Data management strategy and the road ahead

MIT is fortunate to have a valuable asset in the MIT Data Warehouse that provides a single point of access to data from a variety of sources. Improvement in reporting tools is an ongoing process. Based on feedback from the community, the IBM Cognos Suite has been selected as the replacement for the BrioQuery reporting tool with rollout planned for early FY12. It is important to preserve the value of the MIT Data Warehouse as a central point of access to a core set of shared data.

Managing the landscape filled with structured and unstructured data will require that we develop a deliberate strategy to enable the sharing of data.

For **unstructured data**, the intent is not to replace local unique sets of data with a central standardized data set, but rather to ensure the data we need to share is available via SQL or any SQL based reporting tool.

For **structured data** we need to get better at ensuring that application development projects include data definitions, conceptual data models, business process models and reporting requirements upfront, thus enabling access and reporting of data that is vital to so many aspects of decision making at MIT.

As Digital MIT gains momentum and projects are implemented across the Institute, a coordinated review of the data and reporting needs will be required.

Planning, conceptual modeling, business process modeling and definition of the metadata upfront will enable ease of access and usefulness of shared data in the end. Lack of planning and

coordination creates data islands, resulting in poor access to valuable data and the need for additional resources to create access.

Close coordination and alignment with the Data Management Roadmap will be key to managing the landscape of Digital MIT.

Guiding principles and approach

The work of the team and the approach taken were based on the following principles:

- Work with the vast pool of ideas generated by the IT@MIT and the Administrative Process Working groups of the Institute-wide Planning Task Force rather than solicit more ideas from DLCs.
- Focus on pain points identified in Task Force Reports and process simplification to avoid carrying inefficiencies from a paper to a digital process.
- Leverage concurrent work of other groups, including recommendations of the Leader to Leader Digital MIT team, and recommendations of the VPF Digital Archiving Team.
- Align with the vision and work reflected in the IT Roadmaps developed collaboratively by IS&T with respective sponsors. IT Roadmaps approved to date by the IT Governance Committee are: Data Management, Network Security, Education Systems, and Mobile Computing. The Administrative Systems roadmap is under development.
- Review and compare feature sets of existing tools and practices to better align needs with solutions.
- Recognize the importance of collaboration and secure sharing of data and the use of the MIT Data Warehouse as a key repository and data distribution hub.
- In identifying tools, avoid proprietary one-off solutions and require secure data sharing capability.
- Look for evolutionary pathways to solutions that balance short-term needs with long-term sustainable solutions for managing data.

Key findings and recommendations

Data Management

Software development projects, whether they result in unstructured or structured data, often do not include ways to openly access the data and lack data definitions, conceptual data models, business process models and reporting requirements upfront to enable access to data and the reporting that is needed.

Recommendations

- Start to develop a data management strategy that explicitly plans for the sharing of unstructured and structured data for collaborative work and operational and strategic decision-making.
- Encourage application development project requirements to include data definitions, conceptual data models, business process models and reporting requirements upfront to enable access to data and the reporting that is needed.
- Establish a Data Coordination Committee to start this foundational work to define the data needs of the Institute and thereby enable easier access of data sharing across systems without the need for major systems integration and to lay the foundation for a future Enterprise Content Management.

Educating the community

There continues to be a lack of awareness of existing guidelines, best practices and resources that often leads to requests for improvements that have already been implemented. There is an ongoing need to create a repository of additional relevant information in one place.

Recommendations

- Create a *help_Digital MIT* website as a one-stop repository for guidance and assistance in the transition away from paper based processes.
- Provide education and training through a variety of avenues such as use of Frequently Asked Questions, sharing of best practices, publication of retention and secure data guidelines, printing and scanning needs assessment, Print Smarter posters, printing tips, printer and scanner and tools selection guidelines.

Information protection

With increased levels of data exchange and the use of personal and mobile computing devices sensitive data can be at risk.

Recommendations

- Promote secure interchange of content between systems and collaborators, with attention to privacy and sensitivity of content.
- The *help_Digital MIT* site should post links to security standards and information on WISP (Written Information Security Program) and PIRN (Personal Information Requiring Notification)

Record retention

A review of existing record retention guidelines has been undertaken by the VPF Digital Archiving Team with the Institute Archivist, Audit Division and Office of General Counsel.

Recommendations

- It will be valuable to clarify the need to retain paper and electronic documents as required by regulation and Legal Hold Memos versus situations where the Institute may wish to retain the documents for convenience.
- An updated version of the Guidelines for document retention should be made available. Publish this guide on the *help_Digital MIT* website.

Resource needs

The growth in data and applications has resulted in the increased use of the physical and virtual storage infrastructure.

Recommendations

- Provide for increased physical data storage infrastructure.
- Plan for increased resources to support the creation and management of digital content and for investments in the infrastructure needed. These will need to include resources to educate and guide courses of action, choose and implement solutions and procure storage and other resources needed to support the increasing volume of digital content.

Best practices

The following is only a sampling of best practices:

- An effort to promote smart printing across campus through sponsorship by the MIT Campus Energy Task Force student and behavior change initiatives.

- Pilots in VPF, IS&T, Department of Facilities and Athena computing clusters have helped map the process for consolidating single function devices such as printers, copiers, and fax machines, replacing them with multi-function devices (MFDs), and has lead to the development of a more cost effective model for leasing these devices through MIT Copy Technology Centers (CTC).

- Housing has employed the use of digital signatures for leases, which eliminates the need for paper.

- VPF has replaced its paper based performance appraisal process with an online tool.

> **Recommendations**
>
> - Use the *help_Digital MIT* website to house best practices and educate the MIT community in ways to streamline processes, reducing use of paper and improving collaboration opportunities

Prioritization of ideas for process simplification

Multiple initiatives to simplify and digitize existing administrative and business processes are underway.

The team conducted a review of 494 ideas documented by the Administrative Processes Working Group to identify, categorize and prioritize areas of need, which would inform the continuing evolution of Digital MIT. It is encouraging to note that 80 of the ideas had already been completed through ongoing efforts in various administrative areas.

> **Recommendations**
>
> The Team recommends the exploration of the following areas of opportunities described in the Detailed Findings and Recommendations section of this report:
> - Collaboration
> - Data Warehouse
> - e-Forms (with Quick hit opportunities: Key Requests, Temporary Parking Passes and Event Scheduling
> - e-Internal billing
> - Educating the community: guidelines, communication and training
> - Desktop printing reduction and management

These ideas for process simplification will need to be further prioritized in the context of ongoing work within responsible business units, resource availability and alignment with Data Management, Administrative Systems, Security, Student Systems, and Mobile Roadmaps, some of which are still in development. The proposed next step is to explore solutions, draft the scope and requirements as a precursor to implementation in conjunction with the relevant business and IS&T resources.

Appropriate tools and technology

The Team explored content management and collaborative work solutions, by meeting with selected vendors, including current MIT vendors, and assessing the fit with potential Institute needs.

Several comparable tools are available that could equally meet a common subset of needs. Some DLCs have already invested resources in implementing several tools to support Human Resources, Facilities, Sloan and SAP. While most of these tools offer a set of comparable features, each of these tools meets unique local needs, for example, handling CAD drawings in Facilities. While the idea of migrating to a common tool is appealing in concept, implementation for existing users will require reinvestment in conversion of existing implementations, staff time, and would impose a learning curve for use of the new tool.

Recommendations

Short-term recommendations
- The short-term strategy is to choose a tool that ensures a non-proprietary open access to the data. This will provide a mechanism for submission and retrieval of data. It will also ensure the access to data in the future after the tool is no longer supported.
- Based on a limited set of vendor presentations (see Appendix 5) we understand that the tools from these vendors can provide a mechanism for submission and retrieval of data via SQL exports to the Data Warehouse. We encourage the use of tools already in use on campus. Selection from this subset of products will alleviate the need to support a larger number of solutions and to leverage purchasing efficiencies.
- Audit Division, Office of Sponsored Programs (OSP) and the Office of the General Counsel (OGC) have expressed an initial interest in exploring the use of Optix or Perceptive Software for their requirements of collaboration and the need to share data. We recommend a 3-6 month pilot of Optix from Mindwrap as we already have expertise and product availability through Human Resources.

Long-term recommendations
The creation, retention, management and storage of data should ultimately serve the goal of providing timely access to the information needed for a variety of decisions that range from every day operations to strategic planning.

Even as we address our short-term needs to manage data in a Digital MIT world filled with collaboration, it is important to start the foundational work of planning what data is

created, and how and where it is stored so that it that can be easily retrieved by tools in the future. A dedicated team needs to attend to the planning and coordination of this critical work across MIT.

Additional long-term options to explore include:
- Feasibility of vendors adhering to some open standards, to ease integration as well as the export and transfer of documents from one product to another and to the Data Warehouse.
- Feasibility of IS&T's Data Management Group offering a hosted solution to departments and project teams.

Desktop printing reduction and management

As we shift from paper intensive processes to electronic processes, we expect printing, copying, and faxing to decrease while scanning increases. The current landscape is cluttered with desktop printers and scanners, and the hope is that we can streamline this to a model of shared multi-function devices (MFDs).

Recommendations

- Promote moving to multi-function devices and away from proliferation of stand-alone print/scan/fax machines.
- Inform community of appropriate business models for printer management and encourage DLCs to lease equipment with outsourced managed services through MIT Copy Technology Centers.
- Provide an online self-assessment form as a guide to the community for making the right choices regarding their evolving print, scan, fax, and copy needs. Establish a committee to review funding needs for short-term scanner provision, develop criteria for qualifying for funds and communicate this approach to the MIT community. The team should include members from CTC, VPF / Procurement and IS&T.

Implementation

Recommendations

- Create an implementation team to move forward the recommendations of this team.

Detailed findings and recommendations for each area of focus follow.

1. Best practices

Findings

The following best practices, given the time at our disposal, are by no means comprehensive.

- In the past year MIT has made strides in its pursuit of Digital MIT in both Administrative and Student System business processes.

- There has been concerted effort to promote smart printing across campus through sponsorship by the MIT Campus Energy Task Force student initiatives.

- Pilots in VPF, IS&T, Department of Facilities and Athena computing clusters have helped map the process for consolidating single function devices such as printers, copiers, and fax machines, replacing them with multi-function devices (MFDs), and has lead to the development of a more cost effective model for leasing these devices through MIT Copy Technology Centers (CTC).

  o Leveraging recent moves, IS&T eliminated personal printers in the renovated space reducing future expenditures on toner and personal printer renewal costs. The two MFD machines leased from CTC provide otherwise unavailable scanning, duplexing and secure printing features. The make and model of the new MFDs were matched to existing machines in order to minimize the number of vendors supported.

  o Migrating away from a plethora of personal printers to using multi-function devices which perform secure printing, scanning, copying and faxing functions will lead to lower toner costs and reduction in the number of makes and models of printers.

- Implementation of Omega Pharos kiosks in Athena clusters has led to increased levels of two-sided printing and reduction of waste.

- Other efforts are a reflection of DLCs adopting tools that meet their urgent short-term needs for collaboration.
  Examples: Department of Facilities Meridian InCielo, MIT Sloan SharePoint

- Housing has employed the use of digital signatures for leases, which eliminates the need for paper.

- VPF has replaced its paper based performance appraisal process with an online tool.

- The Leader to Leader Digital MIT Team Report of December 2010 lists 12 Best Practices for Digitization that range from organizing around a compelling problem, planning ahead, setting expectations and planning for maintenance of the solution.
  See Appendix 3 for a detailed list of Best Practices from the L2L Digital MIT Team.

Recommendations

We recommend the creation of a *help_Digital MIT* site to house best practices and educate the MIT community in ways to streamline processes, reduce use of paper and improve collaboration opportunities. Examples of resources include:

- lessons learned from DLC implementations such as SharePoint at MIT Sloan and smart printing.

- an avenue for continued collection and sharing of best practices and tools including for printing and scanning.

- Institute Archives & Special Collections Records Management Program at MIT http://libraries.mit.edu/records/index.html

- Athena printing tips http://ist.mit.edu/services/printing/tips

2. Guidelines for document retention

Findings

The MIT Libraries Institute Archives & Special Collections Records Management Program is responsible for records management at MIT. The Institute Archivist in collaboration with the Audit Division and the Office of General Counsel provides guidance.
See http://libraries.mit.edu/records/index.html.
The last update to these guidelines was in February 2009. The VPF Digital Archiving team recently completed a review in collaboration with the Audit Division and the Office of General Counsel.

Recommendations

- As part of the current ongoing review of retention guidelines undertaken by the VPF Digital Archiving Team with the Institute Archivist, Audit Division and Office of General Counsel, it will be valuable to clarify the need to retain paper and electronic documents as required by regulation and Legal Hold Memos versus situations where the Institute may wish to retain the documents.

- It is important to educate the MIT community regarding these important guidelines.

- Recognizing this need, the team created a draft guide of best practices for anyone considering implementing a new document management system, or refreshing an existing one. This business checklist employs a Q&A format and covers questions and topics related to documents' and records' entire lifecycle, from creation (or acquisition) through final disposition; it does not address any IT issues.

  See Appendix 4: DRAFT Guide to Establishing an Effective Records/Document Management System.

- Moving this important work forward would be greatly assisted by additional resources in order to more adequately provide the proper guidance and timely advice with regard to topics such as records retention, digital signatures, and overall document management.

- We recommend a follow-up activity to refine/amplify/vet this guide, and make it widely available to the MIT community.

- Review and update the relevant MIT Policies to make the guidelines operationally useful

- Publish this guide on the *help_Digital MIT* website.

- The *help_Digital MIT* website should also post the following links to security standards and information

  Link to the official information security program, launched on 3/1/2010 (it may also be found via MIT Google of 'WISP'): http://web.mit.edu/infoprotect/wisp/index.html

  Link to the minimum computer security standards expected to be followed by anyone handling PIRN (personal information requiring notification): http://web.mit.edu/infoprotect/wisp/electronic.html

3. Appropriate tools and technology

The Team explored content management and collaborative work solutions, by meeting with selected vendors, including current MIT vendors, and assessing the fit with potential Institute needs. Gartner Research from November 2010 shows the marketplace of vendors, several of which are in use at MIT.
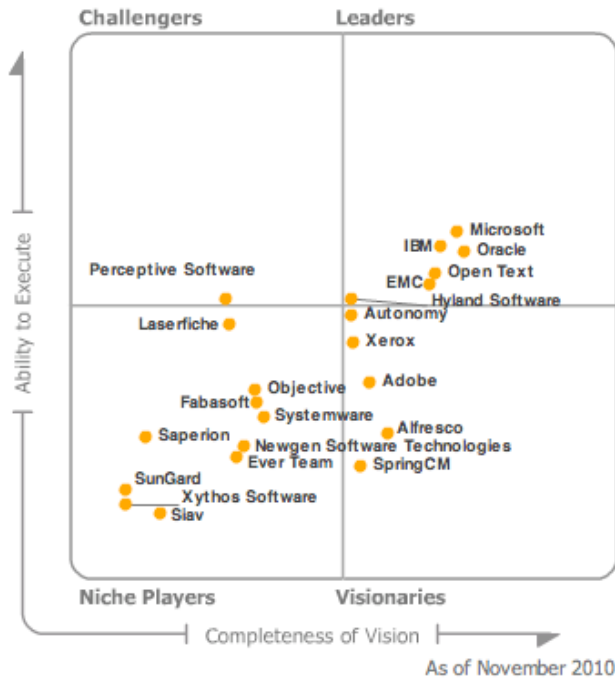
Findings

Enterprise Content Management products **features** include:

- Image Processing Applications for capturing, transforming and managing images of paper documents.
- Document Management for check-in/check-out, version control, security and library services for business documents.
- Records Management for long-term archiving, automation of retention and compliance policies, and ensuring legal, regulatory and industry compliance.
- Workflow for supporting business processes, routing content, assigning work tasks and states, and creating audit trails.
- Collaboration via document sharing, knowledge management, and supporting project teams.

The vendors we explored have a common set of these features.

See Appendix 5 for the Vendor Features Matrix

While cost data is not easily available, Procurement was able to provide spend data for these vendors.

See Appendix 6 for Data on Spend at MIT for Select Digital Archiving Vendors

Several comparable tools are available that could equally meet a common subset of needs. Some DLCs have already invested resources in implementing several tools to support Human Resources, Facilities, Sloan and SAP. While most of these tools offer a set of comparable features, each of these tools meets unique local needs, for example, handling CAD drawings in Facilities. While the idea of migrating to a common tool is appealing in concept, implementation for existing users will require reinvestment in conversion of existing implementations, staff time, and would impose a learning curve for use of the new tool.

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- Based on a limited set of vendor presentations *(see Appendix 5)* we understand that the tools from these vendors can provide a mechanism for submission and retrieval of data via SQL exports to the Data Warehouse. We encourage the use of tools already in use on campus. Selection from this subset of products will alleviate the need to support a larger number of solutions and to leverage purchasing efficiencies.

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Long-term

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Additional long-term options to explore include:

- Feasibility of vendors adhering to some open standards, to ease integration as well as the export and transfer of documents from one product to another and to the Data Warehouse

- Feasibility of IS&T's Data Management Group offering a hosted solution to departments and project teams.

4. Desktop printing reduction and management

As we shift from paper intensive processes to electronic processes, we expect printing, copying, and faxing to decrease while scanning increases. The current landscape is cluttered with desktop printers and scanners, and the hope is that we can streamline this to a model of shared multi-function devices (MFDs). Consolidating machines will reduce associated maintenance and supply costs. We have an opportunity to leverage our buying power with vendors by reducing the number of models and vendors.

Printing and Multi-Function Devices

Findings

Annual volumes (for the period 2009/09/20 to 2010/09/19):
>   60 million total impressions (printing, copying, fax and scanning)
>   42 million sheets: 11 million color and 31 million black and white (73%)
>   42% double-sided

Printing and multi-functional devices (as of February 2011):
>   2,755 total printers on the network
>   2,383 or 87% of these are desktop or stand-alone printers
>   372 or only 13% are multi-function devices

Data source: Virebo, a web-based tool developed for IS&T by Joe Barillari in September 2009. This tool is currently used by CTC, VPF Procurement, IS&T and others for detailed information and analysis of networked printers at MIT. *http://virebo.com/mitmoira/*

Recommendations
1. Promote moving to multi-function devices and away from proliferation of stand-alone print/scan/fax machines. Consolidating machines will:

- avoid idle capacity in individual printers by using higher efficiency MFDs
- provide duplexing capability which reduces paper waste and is often not available in stand-alone printers
- provide environmental benefits: less plastic is used by MFD toner bottles compared to printer cartridge**s**

2. Inform community of appropriate business models for printer management

    There are **several business models** for printer management in use, including:
- DLC manages all aspects from purchasing equipment to managing services

    Typically this effort includes doing research on type of printer to fit need, purchase of printer, installation, ordering supplies and managing maintenance and break fix tasks.

- DLC purchases equipment with outsourced managed services from equipment manufacturer
- DLC leases equipment with outsourced managed services from equipment manufacturer
- DLC leases equipment with outsourced managed services through MIT Copy Technology Centers (CTC).

The team recommends using this last model where the DLC leases equipment with outsourced managed services through MIT Copy Technology Centers, an internal service provider. This leverages expertise at the CTC, enables standardizing on fewer models, and does not require the DLC to expend the purchase cost. IS&T and VPF will share best practices in facilitating this migration as they have recently deployed this model.

Scanning needs

Findings

As we continue to adopt digital processes at MIT, we recognize that the need for scanning has increased. While some areas are in need of guidance in choosing the right machine for their scanning needs, others are also looking for funding to support this growing need. In support of moving MIT to a more digital and modern era, we propose a multifaceted solution toward these challenges that addresses both funding and the selection process.

Recommendations

To support this growing need, we would like to propose a phased solution. For the short-term goal, mitigate the scanning needs, and for the long-term goal promote MFDs with scanning features included. It would be ideal to avoid the proliferation of stand-alone scanners.

Need assessment: Provide a guide to community members to make the right choices regarding their evolving print, scan, fax, and copy needs. A simple self-assessment form would be located online. The purpose of this form is to provide community members with a way to assess their scanning, faxing, copying, and printing needs. This assessment is not inquiring about offset printed projects that are outsourced to vendors, as would be indicated on the link to the form.

Refer to Appendix 7: Preliminary Self-Assessment of Printing, Copying & Scanning needs form

The completed assessment would route to Copy Technology Centers (CTC) for analysis and follow-up. Since MIT is a diverse community with different needs across campus, CTC would identify a few standard models to accommodate different needs, from simple and affordable desktop scanners for small offices, to shared MFDs for larger offices. CTC would purchase the machines from the manufacturers and lease to the departments, providing maintenance and supplies as part of the lease. We recommend that CTC and Procurement conduct a RFP to identify the appropriate vendors and models.

Informed purchasing decisions: We propose that community members be presented with this form when they access Procurement purchasing tools to purchase a printer, scanner, fax, or copy machine. This provides an opportunity to conduct needs assessment and inform the purchase decisions.

Funding needs for scanners

We recommend the formation of a team to assess the funding need, develop criteria for qualifying for funds and communicate this approach to the MIT community. The team should include members from CTC, VPF / Procurement and IS&T.

Resources available to this team would be:

- A Preliminary Self-Assessment of Printing, Copying & Scanning needs form deployed on the *help_Digital MIT* website. *See Appendix 7*
- The Virebo tool

5. Prioritization of ideas for process simplification

Multiple initiatives to simplify and digitize existing administrative and business processes are underway. The Team identified some additional opportunities for *Digital MIT, Phase II*.

The team conducted a review of 494 ideas documented by the Administrative Processes Working Group to identify, categorize and prioritize areas of need, which would inform the continuing evolution of Digital MIT. It is encouraging to note that 80 of the ideas had already been completed through ongoing efforts in various administrative areas.

See Appendix 8 for a categorized list of candidate ideas for process simplification with categories and descriptions and Appendix 9 for completed ideas and other ideas not relevant to the scope.
See Appendix 10 for additional recommendations from the VPF Digital Archiving Team.

Selection criteria

1. Process simplification, increased productivity, and making the transition from paper to digital.

2. Large community impact.

The following table lists the ideas prioritized as **candidates for moving forward** based on the selection criteria. Prioritized areas are highlighted in **grey**.

Category	Needs and current state	Summary recommendation
Collaboration	There is a growing need for sharing documents and collaboration within a DLC, across DLCs, with government agencies and external collaborators. Several areas such as Audit Division, OSP, Office of General Counsel and Department of Facilities and Sloan have expressly noted this need. Several local solutions have already been implemented, to meet the need including: • Microsoft SharePoint at MIT Sloan used for a variety of online collaboration uses including Enterprise Content Management and MySite Social networking, • Meridian InCielo used by Department of Facilities for managing the archiving and sharing of construction documents. Data exchange with the Data Warehouse is planned	• Encourage sharing of collaboration expertise and process solutions via a help_Digital MIT website. • Leverage the IS&T Exchange Server 2010 rollout to start using an initial feature set of SharePoint. • Recognize the need for consulting and storage resources for SharePoint implementations. SharePoint implementations are very involved and require considerable resources and expertise. Implementations without thought to enterprise-wide data sharing needs via the Data Warehouse can result in islands of data. • Conduct a 3-6 month pilot of Perceptive Software (used by Duke University, NYU, U. Pennsylvania, U. Michigan CalTech and over 400 colleges.

Category	Needs and current state	Summary recommendation
Data Warehouse	Ideas for improvement focus on the need to improve the look and feel of the reporting tool, improved ability to do reporting as well as the need to improve data definitions and provide metadata on the type and quality of data available from Data Warehouse. Based on feedback from the community, the IBM Cognos Suite has been selected as the replacement for BrioQuery reporting tool with rollout planned for early FY12.	While the new web based reporting tool will address some issues, it will require the involvement of the business owners and the MIT Community to work on addressing data and reporting issues. Software development projects should include data definitions, conceptual data models, business process models and reporting requirements upfront to enable the reporting that is needed.
e-Forms	Many processes at MIT require paper and electronic forms for authorization, approval Some examples: Key Request, Temporary parking passes, alcohol permissions, HR related, student related, event registration, scheduling meetings. Key Request Facilities issues roughly 4700 keys/year. The current process for obtaining keys via SAPWeb requires the completion of the Key Request Form, which needs to be forwarded by an authorized requestor to key-request@mit.edu for approvals. Facilities is redesigning a new key approval and issuance process and will benefit from a redesign of the key distribution process and systems to leverage the creation of a Work Order, SAP workflow and Roles Database based approvals.	Converting to electronic forms and standardizing the design and workflow tools will add ease of use and enable the use of digital signatures, It would be useful to make all forms available in a central location such as a help_Digital MIT website and allow the use of digital signatures and allow for the appropriate workflow including automatically cc'ing those who need a copy. Quick hit opportunities: Key Request Temporary Parking Passes Event Scheduling
e-Internal Billing	We have internal billing from major service providers to DLCs for cost recovery purposes and among DLCs to share costs. MIT doesn't have an easy-to-use internal billing service (when one MIT department bills another). Examples: Campus Police, Facilities, IS&T, CTC, AV. Each group has developed their own processes, tools, and tracking mechanisms. The volume of these transactions is estimated at over $50 million annually.	Investigate the replacement of the current JV process with an invoice from the internal service. A possibility is that an invoice should be created electronically and linked to the expense on the SAP statement. An invoicing process may enable better reporting capability. It would be good to retain the current approval process where payment of an internal invoice is assumed with the creation of a requisition, so there is no need to have a second step for approval.

Category	Needs and current state	Summary recommendation
Educating the community: Policy, Communication and Training	Lack of awareness of existing best practices and resources leads to requests for improvements that have already been implemented. There is an ongoing need to create a repository of additional relevant information	Create a help_Digital MIT website as a source for education and resources
Desktop printing reduction and management	The current landscape is cluttered with desktop printers and scanners. Only 42% of the printing is duplex.	Promote the migration from personal printers to Multi-Function Devices. Promote best practices for printing such as duplexing and reduced use of color.
Attachments	Several existing digital processes that span from Procurement to HR have a need to attach documents. A method to implement this need exists in Student Systems and is being explored in SAP Administrative Systems.	• Most of the tools and applications available offer the feature of routing attachments and storing them. • The key is to ensure that the approach taken ensures secure movement of the attachments through the business process and has a process for retention and destruction.
COEUS modifications	Several ideas identified a need to modify COEUS including: improved user interface, streamlining the submission process, allowing upload of budget worksheets, link budget to SAP account created for successful proposals, standardize the process for submitting proposals and create templates with centralized standard data available to OSP to save time.	• The ideas will need to be considered in conjunction with added functionality resulting from: Upgrade of COEUS by OSP and improvements from the use of the Data Warehouse and the new web-based tool – RAFT (Reporting and forecasting tool), that allows authorized users to run reports and analyze information about their cost-objects. • Raft Phase 2 features will focus on forecasting.
e-Budget	Need to simplify the current process and workflow of making budget changes and transfers. Better integration with SAP.	Investigate a web-based tool for initiating and managing the workflow of budget changes and transfers. This tool might create one system by integrating budgeting into SAP The opportunity to improve the budget change and transfer process may extend to improving the forecasting capability. A preliminary solution may be more extensive training in the use of '99' budgets and manual reservations or the ability to perform these capabilities through SAPweb.

Category	Needs and current state	Summary recommendation
e-Procurement	Some paper intensive purchasing processes could be simplified for efficiency	Possible solutions include: Simplification of small routine purchases. Develop online process for user submitted documents for credit card verification. Electronic process and workflow for approval of external invoice payments.
Student Systems	A variety of proposed improvements ranging from 1) electronic course registration and grades to 2) linking MITSIS and Web Grad Aid to SAP for payroll (and UROPS) to 3) a centralized database with customizable local modules, 4) admissions and 5) UG major/minor and degree tracking.	The IT Governance Committee is overseeing the development of projects based on a Student System Roadmap developed by Business owners SSIC and IS&T
Vacation Tracker for Administrative Staff	Need online tracking of administrative staff vacation balances	Explore the development of a system similar to Sponsored Research Staff Vacation Tracker; provide consistency and transparency for balance usage and payout.

Recommendations

The candidate ideas for process simplification will need to be further prioritized in the context of ongoing work within responsible business units and resource availability. They will need to be aligned and synchronized with the visions and work reflected in the IT Roadmaps approved by the IT Governance Committee. Roadmaps approved to date are: Data Management, Network Security, Education Systems, and Mobile Computing. The Administrative Systems roadmap is under development.

The proposed next step is to explore solutions and draft the scope and requirements as a precursor to implementation in conjunction with the relevant business and IS&T resources.

Data Coordination Committee and data matters

- MIT is generating many forms of electronic documents including Word, Excel, PowerPoint and pdf files at an increasing pace.
- Many new systems, such as Admissions, Appointment Process Redesign, and Travel have document attachments that represent unstructured data rather than structured data in databases.
- Currently we have several different solutions for managing documents; including IXOS, Sharepoint, Optix, wikis and shared drives.

Recommendations

The following recommendations are aimed at improving the ability to access needed data. They emphasize planning what data is created, and how and where it is stored to enable easy retrieval by tools in the future.

- Software development projects should include data definitions, conceptual data models, business process models and reporting requirements upfront to enable the reporting that is needed.
- It is very important to start **foundational work** to define the data needs of the Institute, establish minimum common metadata for all documents, such as author, date created and system of record.
- We support the vision that was recently presented to the IT Governance Committee as part of the Data Roadmap that emphasized the need to improve data practices at MIT in order to make it easier to access and analyze data for decision support and control processes throughout the MIT community. This includes publishing principles and guidelines for data management, establishing processes for data issue resolution and prioritization, gaining consensus and documenting roles and responsibilities concerning data and developing a method to monitor progress for this important work.
- We recommend establishing a **Data Coordination Committee** to help with this effort and thereby enable easier access of data sharing across systems without the need for major systems integration. This would lay the foundation for a future Enterprise Content Management system.
- The Committee will require participation from business process owners, the Data Management Group and other IS&T Representatives.

Educating the community: A help_Digital MIT website

To move ahead requires leveraging the individual goodwill and interest of the MIT community in designing and conforming to new digital processes. A further inducement is the level of "pain" increasingly experienced by departments transitioning from cumbersome paper-based processes and records storage to various (also cumbersome) electronic solutions. The Team believes that a website with links to resources and tools and methods to assist at the local level is the best way to foster community involvement in this initiative.

The team recommends developing a communications campaign to educate members of the MIT community regarding best practices in smart printing, document retention and the availability of new solutions to reduce paper use, increase access to documents and content, and streamline paper intensive business processes. The campaign would drive members of the community to the *help_Digital MIT* website to access information and tools. The Publishing Services Bureau would work with the Data Coordination Committee to support them in developing the campaign.

See Appendix 11 for a summary of helpful links cited within this report.

Appendices

Appendix 1:   Glossary

Appendix 2:   MIT Libraries' Data and Data Management

Appendix 3:   Digitization Best Practices

Appendix 4:   DRAFT Guide to Establishing an Effective Records/Document Management System

Appendix 5:   Select Print Digital Vendor Features Matrix

Appendix 6:   Data on Spend at MIT for Select Digital Archiving Vendors

Appendix 7   Print Copy Scan Self-Assessment Form

Appendix 8:   Categorized list of candidate ideas

Appendix 9:   Categorized list of completed work and ideas not relevant to scope

Appendix 10: VPF Digital Archiving Team Recommendations

Appendix 11: Reference links