Sustainability of Compatibility Testing

Technology and Leadership (CEP815)

Brian Jenks

April, 2014

Problem of Practice

MSU business teams and faculty use multiple *web-based software applications* in their daily job functions. But technical and learning factors exist which determine (and often limit) the usability and effectiveness of these web applications, and the ability to effectively instruct on their use:

> *No established software or hardware standards.* MSU faculty and staff can order (or download, where appropriate) and use any type of computer or laptop and software that they desire. MSU normally does not limit choices or recommend technical direction or options.

> *Varying degrees of user security rights and permissions.* MSU employees may have full access rights and permissions, which allows them to perform any/all actions on their computers. Some employees have no access rights/permissions. The rest (and most exist in this category) possess a level of access rights and permissions that fall somewhere in the middle between "All" and "None."

> *No central Information Technology (IT) support structure.* MSU employees may be supported by technical resources physically located in the same building/area; remotely using software to connect a technical person to an employee's computer regardless of physical location; by other means such as phone or webpage support; or some combination of the support methods listed. No single area coordinates or is responsible for dictating and directing hardware or software support for all MSU computer users. Additionally, there is no established central communications process between the various technical support areas, or to the MSU employees that use computer software.

> *Web technologies are continually introduced, evolve and change.* Unlike mainframe applications that remain relatively unchanged and work for years without disruption (and thus do not require updates to user knowledge and skills), web-based software continually changes. Web technologies mature and expand, and this results in supporting software (computer operating systems, web browsers) to continually upgrade in order to support the new web technologies, and to offer enhanced security options to prevent unauthorized activities.

My specific focus for this project is MSU's Enterprise Business Systems (EBS) software. This web-based software provides business functionality for MSU's HR/Payroll, Finance and Business Intelligence (BI) areas, and it is used by over ten thousand campus employees. During this large project, MSU business and IT teams centrally worked to develop and test multiple software applications with various operating systems and browser versions. Instructional and technical information was publicized to campus users through a central communications team.

Now that the EBS Project is officially ending (mid-year 2014), these business and development teams have begun to dissolve and employees are either returning to their home offices (buildings), or are leaving MSU completely (many with detailed technical knowledge). This transition has raised many questions and discussions with what will become of the centralized processes that were created under the project when it operated as a whole entity. As such, I have decided to address the issue of **maintaining ongoing compatibility testing with EBS applications;** and there are also applicable learning opportunities and goals.

Technical Solution

My solution to maintaining compatibility testing is to first interact with three MSU business teams (HR/Payroll, Finance and BI) and incorporate as much of the existing (centralized) testing processes as possible, while addressing the logistic issues with testing resources (testers, technical equipment, communication methods) that are (or potentially will be) located all across MSU's campus, including:

- The equal and fair sharing of physical testing hardware (laptops) between multiple offsite business teams.
- The replacement of old/non-working laptops and MacBooks, complicated by the elimination of the central source of hardware and software procurement (EBS Project).
- No knowledgeable, central source to manage a testing phase (planning, scheduling, maintaining hardware, communicating test results and end user instructions).

My solution is two-part; the first part involves a proactive, recurring process that is consistently performed at the beginning of each calendar quarter (January, April, July, and October):

1. Perform a software "Gap Assessment" that checks for new and/or untested versions of operating systems and browsers, using the current "EBS-supported" software list.
2. For any new/untested versions identified, confirm that both the EBS application vendors and MSU infrastructure/systems support the software. If the new software is not supported by either the EBS application vendor or current MSU technical infrastructure, the Gap Assessment ends for that quarter, and no compatibility testing is performed. If a new software version is supported by EBS vendor and MSU, the process continues to step #3.
3. Plan for Compatibility Test: identify the MSU business team(s) participating, create a Testing Schedule, and specify the Testing Laptop Configurations (permutations).
4. Update/configure the test laptops (versions of OS, Browsers, Adobe Reader, Office, etc.)
5. Execute EBS software compatibility testing, using test scripts created during the initial testing of the EBS project (*all test laptops are stored and all testing performed at the HTC building, located in East Lansing at 4700 Hagadorn Road*). A conference room at HTC will be reserved to act as a testing room for the testers arriving from other locations on the MSU campus.
6. Create, report and retain compatibility testing results; use information to update end user instructional documentation and communications.
7. Publish testing results and related documentation to EBS Campus users and their support teams.

The second part of this project solution includes an evaluation and replacement of old testing (laptop) equipment that is beginning to fail:

1. Evaluate and identify new hardware and any related software for EBS business teams.
2. EBS business teams purchase Windows laptop(s) and Apple MacBooks on a recurring schedule (every 3-5 years based on capability and need); also purchase new operating systems and other software that supports the testing effort (such as Office), as needed.
3. Provide hardware and software maintenance/service that includes break/fix support, along with installing software updates and configuring both the hardware and software.

The above processes and an estimated budget will be captured in a Service Level Agreement (SLA) and signed/approved by all involved MSU teams/areas. The SLA will be reviewed annually and can be amended or cancelled at that time. If cancelled, the MSU business teams will retain all hardware and software they have purchased.

Resources

The following list identifies internal and external resources that are involved with this project, along with descriptions and project responsibilities [refer to the Technical Solution section of this document for additional information]. Internal resources are designated as being a current department or team within MSU's Information Technology [IT] Services area; external resources are MSU departments and teams outside of /excluding IT Services.

Internal Project Resources

1. **Systems Architecture and Testing (SAT) team**. This is the team that I work for. In addition to being the primary technical point of contact for this solution, it also has the following direct project responsibilities: (a) Software Gap Analysis; (b) Compatibility Test Planning and schedule; (c) Specifying testing laptop software configurations; (d) Acquiring testing rooms at HTC building; (e) Storage and user assignment of testing hardware; (f) Creation and coordination of MSU end user communications related to testing results; and (g) Assists with identifying new testing hardware for purchase by MSU business teams. *SAT does not charge for any of these services provided to the MSU business teams.*

2. **Desktop Support team**. This team has the following direct project responsibilities: (a) Update and configure testing hardware and software, including security patches and other updates; (b) maintain and perform laptop and MacBook servicing to address all hardware and software issues; (c) work with SAT team to identify new testing hardware for purchase by MSU business teams. *This team charges a rate of $65 per hour for these services.*

3. **IT Services Management**. Includes management and executives for the IT Services area, who work to ensure all requirements and timelines specified in the Service Level Agreement are met/exceeded. These managers have project and budget approval and authorization capabilities.

4. **IT Support Help Desk**. Receives, diagnoses and manages technical issues from MSU software users. Issues with internal testing laptops are also reported to this team, who then create a ticket for Desktop Support to resolve. They also receive technical and procedural questions regarding the use of EBS applications from all campus users.

5. **MSU Computer Store**. This internal MSU store is where all laptops, MacBooks and software for this project will be purchased from.

6. **Central Communications Team**. This is an IT Services communications teams that will be responsible for publishing compatibility testing results and related documentation to MSU end users. At the time of the creation of this document, the exact IT Services communications team has not been determined.

External Project Resources

1. **MSU's HR/Payroll Business Team**. This is one of three MSU business teams that will pilot this compatibility testing project. Their direct responsibilities include: (a) Confirming their EBS application vendor and MSU business systems/infrastructure support the new software versions available for compatibility testing; (b) Performing actual compatibility testing, using testing scenarios and scripts from prior EBS testing phases; and (c) Recording and storage of testing results, and communicating these same results to the SAT team.

2. **MSU's Finance Business Team**. This is one of three MSU business teams that will pilot this compatibility testing project. Their direct responsibilities include: (a) Confirming their EBS application vendor and MSU business systems/infrastructure support the new software versions available for compatibility testing; (b) Performing actual compatibility testing, using testing scenarios and scripts from prior EBS testing phases; and (c) Recording and storage of testing results, and communicating these same results to the SAT team.

3. **MSU's BI Business Team**. This is one of three MSU business teams that will pilot this compatibility testing project. Their direct responsibilities include: (a) Confirming their EBS application vendor and MSU business systems/infrastructure support the new software versions available for compatibility testing; (b) Performing actual compatibility testing, using testing scenarios and scripts from prior EBS testing phases; and (c) Recording and storage of testing results, and communicating these same results to the SAT team.

4. **Other MSU Business Teams**. Although not part of the initial phase of this project, the long term (sustainability) portion is to expand this project to other MSU teams that are not currently performing compatibility testing (or don't have a standard testing process).

5. **MSU Software Users**. These are the "end users" or customers of this project initiative. As such, their feedback on using compatible software and understanding related IT Services-generated communications are paramount to both the direction and any tuning/adjustments produced by this project.

6. **External Technical Support Teams**. The local technical resources (outside of IT Services) that provide assistance to MSU software users with their security rights and permissions. They may be tasked to perform downloads or configure user hardware settings, as outlined in IT Services-generated technical user communications.

Budget

An estimated 2015 budget for the MSU Finance business team is included at the end of this document as Attachment A. Testing Laptops and MacBooks will have their hard drives partitioned so that multiple operating systems and software permutations can be loaded to each machine, to simulate the more common MSU configurations in use.

Sustainability

There are multiple objectives for this testing initiative:

1. Establish a framework for compatibility testing that is recognized by MSU business teams as a successful and easy-to-follow method for testing new operating systems and browsers.

2. Expand this service to other business areas and teams that use business software and have a need for a consistent, successful approach for compatibility testing. Services provided may include some or all of the components of this project. In this manner individual MSU business teams will drive the exact direction and scope of their testing effort, using the experiences, skills, knowledge and direction of my SAT team to provide a flexible, yet structured "framework" solution.

3. Use as a template for creating similar frameworks for other software development and testing areas at MSU, as a means to develop and implement university-wide standard processes that improve software quality and end user communications.

For this project to expand and remain successful, the following leadership skills and learning opportunities will be required of me:

➢ Identify the action logic of the leadership I will interact with as I look to expand this service into new areas of MSU. Most leaders that I am familiar with today are Experts, Individualists or Strategists, but I also must be ready for Opportunists, Strategists and Alchemists. Being able to frame the testing process and represent the benefits to the business team in a way that re-enforces their management's beliefs and culture will improve my chances of successfully expanding this process to new areas of MSU.

➢ While some negotiating may be necessary, I'm looking to lead this project only as far as it takes to implement a consistent/standard framework, with only a few key objectives being mandated ("when" testing and end user communication takes place quarterly, and direction on base testing hardware and software configuration, so that testing is performed across campus on a roughly identical playing field of similar operating system and web browser versions). I will leave the management of this project along with related changes up to each individual team, to put their own best practices and directives in place. By providing this flexibility I look to gain an overall acceptance of the direction and benefits that are provided to MSU and especially to the end users of business software.

➢ I firmly believe in Thousand and Villa's (2000) research and suggestions for managing complex change. To this end, I am passionate about sharing my vision on the benefits of structured testing and in what way(s) it provides incentives back to the teams performing testing. I will create and publish a checklist that lists the skills and resources that will be needed, and the outline of an action plan that allows for individual team customization.

➢ Because some business teams may have no formal testing experience, I plan to update my Software Testing Reference website (http://msutesting.weebly.com/) to provide additional background on testing, and full testing scenario and test script templates that can be used. My SAT team will be available to provide in-person instructional and/or consultation sessions on testing so that all business teams get the necessary basic testing background and detail needed to successfully implement this endeavor.

Identifying the level of success of this project initiative is not an easy or direct process. I've experimented with end user surveys in the past, but the submission levels were very low and I do not feel the feedback they provided was honest, but instead represented what the user thought our department "wanted to hear." This unfortunately can't be farther from the truth. In order to implement corrective change it must be based on honest feedback of what end users have questions on or what they struggle to perform. Add to this that MSU has thousands of employees from around the world, with different technical backgrounds/skills and preferred instructional/learning methods.

With this in mind, after implementing this project with each business team, MSU User metrics and feedback will be collected by the IT Help Desks and analyzed by the SAT team as a way to determine how successful compatibility testing and supporting instructional documentation is, to identify possible ways to improve this testing process and also how IT Services can best communicate and instruct users with MSU's various business software.

I will also rely on feedback from the business teams performing compatibility testing. Are they comfortable in what they need to test, and to what granularity? Do they know how to gauge if a test is successful, not successful, or something in between that needs further review and analysis? Providing some baseline expectations and goals is important to establish a repeatable and ongoing process, and I will review team results and question the testing resources and their management as necessary to establish successful patterns and direction.

Ultimately this project's sustainability will be successful if I can bring to MSU some informal IT standards and frameworks to the entire software development and testing processes, where today none exist.

References

Knoster, T., Villa, R., & Thousand, J. (2000). A framework for thinking about systems change. R. Villa & J. Thousands. (Eds.). *Restructuring for caring and effective education: Piecing the puzzle together.* (pp. 93-128). Baltimore: Paul   H. Brookes Publishing Co.   Retrieved 4/15/2014 from: http://www.pbisnetwork.org/wp-content/uploads/2013/02/D.-Richards.Complex-Change-Handout.pdf

Attachment A

2015 Budget (Estimate) for Finance Team

2015 Purchases	Quantity	Unit Price	Cost
MacBook Pro 15" (dual boot) w/Retina Display, 8 GB RAM and 256 GB Flash Storage, DVD drive, Wireless and Ethernet connectivity.	1	$2,100	$2,100
Windows Laptop (tri boot): Dell Inspiron; Core i7, 15.6" display, 8 GB RAM, 1 TB hard drive, DVD drive and Ethernet/Wireless connectivity.	2	$900	$1,800
Office 2013 – License (one per Laptop/MacBook)	3	$60	$180
Office 2013 – Media (DVD)	1	$30	$30
OS Upgrade – License (two per Windows Laptop, one per MacBook)	5	$75	$375
OS Upgrade – Media (DVD) – Windows and Mac	2	$30	$60
2015 Desktop Support Servicing		**Unit Price**	**Cost**
Hardware and Software Configuration and Maintenance (1 hour per machine per quarter)		$65 / Hour	$780
2015 Estimated Total (Purchase price includes setup and installation; obtained from the MSU Computer Store on April 22, 2014)			**$5,325**

Budget Notes

➢ Annual support charge and any supplemental support charges (high priority incidents outside support plan hours) will be established in advance of executing this SLA

➢ On-site support, for locations outside of the Hannah Tech Center in East Lansing, are subject to University travel authorization and reimbursement. The customer is responsible for these associated costs.

➢ There are no costs for any services provided by the Systems Architecture and Testing (SAT) team. Estimated charges for purchasing, and Desktop Support services based on this agreement are listed below.

Note: For contract years without hardware and software purchases, only the Desktop Support "Servicing" charge is applicable.