Team Members

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<thead>
<tr>
<th>Team Member</th>
<th>Affiliation</th>
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<td>University Registrar</td>
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<td>College of Liberal Arts</td>
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<td>Library Science</td>
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* Team leaders

Executive Summary

Cloud based services have become commonplace and often seem to be an easy and fast solution to meet business and personal needs. Contracts and user agreements are being entered into by the University and by individuals at the University in increasing numbers and frequency. While these services often offer capabilities needed to meet business requirements, they also contain risks which are often not obvious to the parties entering into agreements. These include fiscal, legal, security, and reliability concerns. It also appears that work and personal use of such applications is increasingly mixed in nature.

To address these concerns the committee chose to list known concerns and risks, research how cloud services are being used in University business currently, identify methods for raising awareness of risks and appropriate procedures, and recommend resources that meet University approval for user consideration.
Scope of Investigation:

The committee identified the following objectives for investigation:

a) **Risks and concerns with cloud based solutions**
   
   *This was suggested as an outcome to the MS Office Alternatives Team 5 project where they found that: “To help determine the “readiness” of the Purdue community in terms of cloud-based solutions our survey asked about the use of other cloud-based solutions. About 80% have a Facebook account that they view and of those, 83% view it at least once a week. For iTunes, 70% have an account and 77% use it at least once a month. Based on this information, we believe most people who responded are comfortable with cloud-based alternatives.”*

   The following list of considerations should to be examined for all cloud-based solutions before entering into agreements:

i) **Service Quality/Cost/Support/Guarantees**
   
   (1) Service Level Agreements/Terms of Support (Are there warranties of services provided? Was the service vetted through a RFP that outlined requirements of service before entering agreements? What happens when service levels are broken? What communication methods exist to address and remediate service failures? How is support provided for use of product? )

   (2) Vendor Lock-in (Does using a cloud service make it difficult to switch providers in the future due to proprietary formatting or service features? Is data stored in a proprietary format? Can it be recovered if a contract or agreement is terminated? How long is data accessible after agreement termination?)

   (3) Price containment (True cost of service? Can the benefit of using the cloud service versus using an enterprise service be measured? Are there any stipulations that the price cannot be raised at will or by a certain percentage per year? Are there hidden costs such as over-quota usage charges? Are there data retrieval/purging charges? Is the service being considered material to the operations of Purdue or the mission?)

   (4) Exit strategy (How does the University back out of service provider use/contract?)

   (5) Service Provider Reliability (Is the service provider stable as a company? Can the service provider grow to meet future needs? Is the service provider open to change requests and product enhancement requests?)

ii) **Legal Considerations**
   
   (1) Terms of use/license (These agreements are often acknowledged by the end user of a particular product and not reviewed by the University. There are questions surrounding these agreements which need to be answered on
case-by-case basis. Who can change these terms? Is a new agreement required when terms change? How are service consumers notified of changes to terms? Was the service vetted through contracts and procurement office?)

(2) Intellectual Property protection and laws (IP laws differ by country. Where is the provider located and what country laws apply? Who owns the data and is that spelled out in the contract/agreement?)

(3) Indemnification (What service provider protections are included in contract or agreement? What Purdue responsibilities and protections are included in agreements? In the case of user-entered agreements, what end-user responsibilities are included? Can these be transferred to the University in the case of misuse by an end-user? Who is responsible for the contract/agreement once entered into?)

(4) E-Discovery (How is data retrieved when needed? Can it be retrieved by court order? What is the data retention policy of the provider?)

(5) Ecommerce (Does the service provide transaction capabilities? Is it compliant with University monetary practices and regulations?)

(6) Regulatory reporting (Is it possible to report on or audit service for compliance? FERPA, HIPAA, SOCI)

(7) Appropriate Use (Does the data produced or stored by the cloud service fall into the ‘sensitive’ or ‘restricted’ categories as defined by Purdue policy at http://www.purdue.edu/securepurdue/policies/dataConfident/restrictions.cfm? If so, does the service provide adequate protections to meet compliance?)

iii) Security and Privacy of Data

(1) Access Management (Who can access content? Can service be managed by non-account holder? How does or can the vendor use data for analytics/marketing/resale? Can data be accessed when primary account holder is not available? How are accounts authenticated to access data? Who controls authentication?)

(2) Data Protection (How is data loss prevented by cloud provider? Is data encrypted?)

(3) Responsibility (What are the responsibilities of the service provider, University and service users in the event of a data breach? How is reporting handled? Are there established remediation plans and consequences?)

(4) Reputation Risks (In the event of data compromise or loss what risk is there to Purdue’s reputation?)

(5) Logging (Does the service allow access to logs of data and service usage? What tools are available to detect improper access?)

iv) Data Ownership and Management

(1) Control of content (Can/does the vendor expose data to third parties? Can the data leave US based storage facilities? Can content be fully and permanently deleted? How is data recovered from the service provider in the
case of withdrawal of use? What are data retrieval options in case a service provider goes out of business?)

(2) Data Standards (Is it possible to assign/ use own data definitions/meta-data for compliance with reporting/metrics?)

(3) Platform Integration (Can data from the cloud service be used with other applications in use by the University?)

(4) Worker knowledge (Will the use of this service displace enterprise workers and knowledge? Is that knowledge proprietary or easily transferable? Can such knowledge workers be easily re-integrated n the case of bringing the service back to the enterprise?)

b) **Identify where there are cloud-based solutions being used currently**

   i) A detailed list of reported services in use is attached in Appendix A. It is obvious from the findings that cloud services are being heavily used at the University in all capacities of the business. The responses were limited so there is good reason to believe the attached list is not exhaustive and other services are also in common use.

   ii) Most services in use are not being reviewed by Procurement and Contracts. The committee recommends a strongly worded statement encouraging everyone to contact Procurement Services through a cloud service hotline before agreeing to any contract or terms of service. The details are listed in the recommendations below.

   iii) It is also interesting to note that there are software packages which contain cloud components such as Endnote which users may not think about. Even cell-phone backup software often stores information the cloud storage which could contain Purdue proprietary data.

c) **Raise awareness about the potential risks associated with cloud-based solutions**

   i) The committee has agreed that a user education campaign should be used to raise awareness of risks and appropriate use of cloud services. A detailed plan is outlined in the recommendations below.

d) **Provide a concept for the creation of a list of related technical resources available**

   i) Purdue University either provides or has contracted with providers for most service requirements. Sometimes these services are not well advertised or explained to service consumers such as data storage. Sometimes usage of external services is just a personal choice. A matrix of currently internally provided, contracted or approved services along with what solution they provide may assist consumers in making
better choices on picking a cloud service provider particularly when integrated with the awareness and training recommendations of this report. A brief example is included in recommendations but will need to be further developed.

**Recommendations**

Purdue currently has a webpage titled “Cloud Computing Consumer Guidelines” at [http://www.purdue.edu/securepurdue/bestPractices/Cloud%20Consumers.cfm](http://www.purdue.edu/securepurdue/bestPractices/Cloud%20Consumers.cfm) which was last updated 11/21/11. This document contains some good information but needs to be updated with improved user-friendly wording and by breaking out some components.

**a)** Create a website which contains the following items:

i) A homepage that explains what cloud services are in simple language and why it is important to be cautious about selecting a cloud service provider. This page should include either further information or links to other pages detailing the following with an emphasis on simplicity and ease of use.

ii) A list of considerations based on the report above to assist consumers in making wise choices on cloud service consumption.

iii) A list of example scenarios and what should be considered in each case. (recommendation D below)

iv) Training materials to include a short video or videos on cloud service selection and introducing the hotline (recommendation D below)

v) Information on where to call to have questions answered or a contract/agreement examined and approved. (recommendation C below)

vi) Links to data classifications, related policies, relevant documents

vii) Page that lists current enterprise provided solutions, contracted solutions and pre-approved services (recommendation E below)

**b)** The following statement should be included in the above pages where appropriate:

“Cloud-based services, even those that may be provided free of charge, should be reviewed and approved by Procurement Services if they are to be used for conducting University business or storing any University data. Only University Procurement Services are authorized to enter into a contract on behalf of Purdue University. Individual employees and departments that wish to use a cloud-based service to conduct University business should contact Procurement Services.”
A phone number and email address for the ‘hotline’ should be included with the above statement.

c) **Create a ‘hotline’ resource**

A resource through Procurement Services for employees to contact with questions or to have a contract or agreement evaluated. This may be a new number and email or currently in-use ones but needs to be obvious where to call on the webpages listed above in recommendation ‘A-ν’.

d) **Create consumer education materials**

To be included in recommendation ‘A-iii and A-iv’ above. These should be easy to understand and include information of how to evaluate cloud services, what data can be stored in these solutions, and where to go for further help. Video tutorials would be helpful to users and tend to get more attention than a long list of text.

e) **Create a matrix of currently provided solutions, contracted solutions and pre-approved services by service type.**

For example -

If you are considering one of the following solutions please consider using these approved resources:

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<tr>
<th>File Sharing (like Dropbox, Box.net, OneDrive)</th>
<th>Name:</th>
<th>Service Provider:</th>
<th>For more information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synplicity</td>
<td></td>
<td>Purdue University</td>
<td>URL</td>
</tr>
<tr>
<td>File Locker</td>
<td></td>
<td>Purdue University</td>
<td>URL</td>
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<tr>
<td>Research Data Depot</td>
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<td>Purdue University</td>
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