



## Collaborative work and tools in IST: Some initial research results

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### Executive Summary

"Team collaboration suites" - applications that create online "spaces" in which members of a team can work together, performing activities such as sharing documents, writing collaboratively, and assigning and tracking team tasks - offer considerable promise for supporting and enhancing the effectiveness of some of the collaborative work performed by IST staff. Because of their usefulness, various groups in IST have begun using several such suites on an *ad hoc* basis in a number of project, service, and unit activities.

This project was initially conceived of as an effort to help IST standardize on the use of a single team collaboration suite, given the use of multiple such products - including bSpace, BearShare, and Basecamp - within the organization. Following IST Transition Team review, the project team was asked to conduct research and analysis on collaborative behaviors and needs related to collaboration suites within IST, as a first step toward potential standardization on the use of a single product. This report is the outcome of that initial research and analysis phase of the project.

Although this initial research has had the goal of enhancing the effectiveness of internal collaborative processes solely within IST, this area of investigation ultimately may also identify new or enhanced services that IST can provide to the campus.

The project team surveyed and carried out focus group discussions and interviews with many members of IST and the Office of the CIO. The project team found that most collaboration within IST currently takes place outside of the content of team collaboration suites, using many tools such as:

- Bug tracking
- Calendaring (example: CalAgenda)
- Change management systems
- Discussion forums
- Email (CalMail)
- File shares (Windows and Unix file servers, WebFiles)
- Instant messaging
- Knowledge bases
- Project management systems (Microsoft Project, including Gantt and PERT charts ...)
- Project Portfolio Management systems
- Ticketing systems
- Version control systems
- Web/video conferencing (WebEx)
- Weblogging ("blogging") tools
- Wikis

Neither team collaboration suites nor any other single tool is suitable for every type of collaborative process within the organization. Rather, a combination of many types of "collaborative tools" are needed for IST to

function. Even if staff were to fully use every feature of the most feature-rich team collaboration suites, there would still be a vast amount of collaborative work that would need to be carried out using tools such as those listed above.

The use of team collaboration suites is also relatively new to IST, and their use is not yet widespread within the organization. Even many staff who have used them have so far used only a modest number of their features, though most have expressed eagerness to learn how to use them more fully. However, even in this relatively brief time, there have been a number of groups within IST that have found these suites very useful in supporting certain types of collaborative work. If adequate levels of training and support were provided, these suites would likely be much more widely adopted and their features more fully used. To provide the necessary resources for this to happen, standardization on a single suite would be highly desirable.

Based on an analysis of this input, the project team recommends that IST:

- **Formally evaluate the following team collaboration suites against the technical, licensing, and feature requirements listed below, and develop a recommendation for the use of a single team collaboration suite within IST:**
  - bSpace
  - Basecamp
  - BearShare, particularly the next generation of this service that will be based on Microsoft SharePoint 2007, and which may potentially address many of the criticisms of Microsoft's current product voiced by IST staff.
  - Web-based hosted solutions in this space, such as Zimbra, WebEx, or Google Apps for Education.
- **Select a standard "toolbox" of task-specific collaborative tools adapted to the different sorts of collaborative processes in the organization.** The selected team collaboration suite will be the core of this toolbox.
- **Provide ongoing support (possibly based in the Technology Program Office) for this toolbox of collaborative tools by:**
  - **Providing training, documentation, and end-user support related to the use of collaborative tools, including team collaboration suites.** Best practices, fostered by training, documentation, and support, are essential to successful use of collaborative tools within IST. Training needs to cover not only how to use the tools in the abstract, but how to use them in the specific context of work on a particular project or service team. In addition to optimizing the use of the selected collaborative tools, this training would align well with the increased focus on project management training in IST.
  - **Continuing development of whichever team collaboration suite is selected and implemented.** Simply having a suite in place is not as useful as adapting the tool to support various collaborative behaviors, such as developing templates for various types of projects and workflows; integrating it with other tools, such as enterprise-wide email and calendaring; and resolving operational problems and user frustrations through product improvements or implementation changes.
  - **Continuing to examine collaborative behaviors in IST,** further defining work roles and collaborative processes (including IST's matrix management practices, as those are developed over time); spotlighting high value collaborative processes and determine how collaborative tools can work with and support those processes; and identifying and disseminating best-practice behaviors around the use of collaborative tools.
  - **Continuing to track the rapidly-developing world of collaborative tools** to ensure that IST continues to take advantage of state-of-the-art tools to do its work.

## Terminology

A "**team collaboration suite**" is an online application that creates workspaces within which a project or service team can work together, using a set of tools that act on data stored in a project repository. Collaborative writing, document sharing, and task assignment and tracking are examples of the types of

functionality offered by these suites. The suites of this nature currently in use within IST include bSpace, BaseCamp, and BearShare.

A "**collaborative tool**" is a tool or method that is used by IST staff to collaborate. This includes team collaboration suites in addition to other tools such as:

- Bug tracking
- Calendaring (example: CalAgenda)
- Change management systems
- Discussion forums
- Email (CalMail)
- File shares (Windows and Unix file servers, WebFiles)
- Instant messaging
- Knowledge bases
- Project management systems (Microsoft Project, including Gantt and PERT charts ...)
- Project Portfolio Management systems
- Ticketing systems
- Version control systems
- Web/video conferencing (WebEx)
- Weblogging ("blogging") tools
- Wikis

## About the project

This project was conducted from early September through early November 2006. It was proposed by the Collaboration, Presentation and Analysis (CPA) unit of IST's Data Services, based on a request made by David Greenbaum, Director of Data Services.

Members of the project included three members of IST-DS-CPA, as well as representatives from each of the other major units within IST and the Office of the CIO:

- Chris Ashley
- Randy Ballew
- Ian Crew, Project Lead
- J. Kevin Haney
- Rick Jaffe
- Jeff Kreutzen
- Jeff McCullough
- Aron Roberts
- Dianne Walker

## Scope of the project

- The project's charter has been to conduct research on tools for enhancing team effectiveness and facilitating group collaboration within IST, with an aim of identifying opportunities to standardize on collaborative tool use within the organization. Ultimately, this area of investigation may potentially lead to new or enhanced services that can be made available to the entire campus community.
- This research and analysis was gathered with the ultimate goal of potentially standardizing IST's use of two types of collaborative tools: team collaboration suites and blogging tools.
  - Team collaboration suites are online applications that create workspaces within which a project or service team can work together, using a set of tools that act on data stored in a project repository. Collaborative writing, document sharing, and task assignment and tracking are examples of the types of functionality offered by these suites.
  - Blogging tools facilitate posting of chronologically- and topically-organized content. They can be used for some traditional online publishing tasks, as well as to facilitate contributions to "conversations" about ideas and practices. (Blogging tools were a later addition to the project's

scope.)

## Research activities carried out by the project

Work carried out under this project has sought to identify:

- Representative examples of the ways that IST staff collaborate with one another in their work.
- Specific IST work processes which have been aided by collaborative software tools.
- Composite staff roles that perform one or more of those processes.
- Usage patterns of "team collaboration suites," products which combine - and often integrate - two or more individual collaboration tools.
- Satisfactions and dissatisfactions with those suites.
- Technical requirements that team collaboration suites should meet when being considered for standardization.
- Additional team collaboration suites and individual tools which merit investigation, in addition to those currently used within IST.
- The landscape of blogging tools and how they might be used within IST - a late addition to the project scope.

In the course of this work, the team has:

- Launched an online survey of collaborative tools users within IST, and analyzed 27 completed responses.
- Conducted four focus groups, at three different IST building sites, which engaged a total of 16 IST staff together with representatives of the project team in candid group discussions about the use of collaborative tools in their work. (Throughout this report, the term "IST staff" is used to refer to all employees of IST, including the four unit Directors and managers at all levels.)
- Conducted individual interviews with several other IST and campus users of team collaboration tools.
- Interviewed Michael Leefers, administrator of IST's BearShare service.
- Interviewed Karen Miles, who manages training and support for ETS's bSpace service.
- Interviewed Marti Harris, an analyst from The Gartner Group, about the use of collaborative tools in higher education.
- Reviewed research reports on collaboration and collaborative tools from The Gartner Group, Forrester Research, and The Burton Group.

## Research findings

### Overview

Findings about IST's current collaborative environment:

- Most collaboration within IST currently takes place outside of the content of team collaboration tools. Much of that collaboration occurs using such long-standing tools as email, file shares, and shared calendaring.
- Through modest, focused investments in training and documentation, it may be possible to significantly leverage the use of existing tools for collaboration. This in itself offers the potential to realize significant benefits, entirely unrelated to any adoption of newer tools targeted at fostering collaborative work.

Findings about team collaboration suites:

- Team collaboration suites and blogging tools are both a relatively new introduction to the mix of collaboration tools used within IST.
- At least three team collaboration suites are currently being used on an *ad hoc* basis within IST. Three of the most prominent - BearShare, bSpace, and Basecamp - are each discussed in more detail, including the positive and negative experiences that IST staff have had with each.

- Team collaboration suites have sometimes been introduced into IST collaboration processes with little or no training in their use. Even brief initial training and orientation may yield significant productivity benefits.
- The use of team collaboration suites, as well as of certain individual collaborative tools, may be able to at least partly address three long-standing sources of frustration among IST staff: email "information overload"; inefficiencies in how documents are stored, shared, and found; and barriers to working collaboratively on documents.

Criteria for selecting suites and tools for standardization:

- New IST project teams often need to "hit the ground running," dictated by tight deadlines and limited time slices of each member's participation. At least one team collaboration suite should fit that model, requiring an absolute minimum of setup time and making it possible for its participants to begin performing simple tasks right away. If no single suite fits that model yet offers the full set of required features, one potential option might be to standardize on two suites: one more feature-rich but requiring more time for site setup and potentially also presenting a steeper learning curve, the other suitable for simple collaboration on a more rapid timetable.
- An understanding of collaborative processes in IST should help guide any decisions about standardizing on the use of specific collaboration suites or tools, to help ensure that investments are made around collaborative processes that have high value, and that the tools chosen do a good job of supporting those processes. Descriptions of some composite work roles in IST, and selected collaborative processes associated with those work roles, are presented as a starting point.
- Any team collaboration suite on which IST might standardize should ideally meet a set of basic technical, licensing, and feature requirements, and a proposed initial list of those requirements is offered.

## **Online collaborative work within IST**

The project team came to a number of conclusions about online collaborative work within IST:

### **Most "collaboration" occurs outside team collaboration suites**

When IST staff are asked about the collaborative work they do and the tools they use to perform that work, they most frequently mention tools other than team collaboration suites. Staff collaborate with one another and their campus counterparts in a great many ways, often using traditional tools such as email, file shares, and ticketing systems, and most collaborative work appears to be conducted using those tools, rather than tools or tool suites specifically targeted at team collaboration.

Many of the staff who attended focus groups said they had not yet used team collaboration suites, and even many staff that had used them collectively asked many questions about their features and about how to make best use of them. It is clear that, within a relatively brief time, team collaboration suites have already made significant inroads into the organization, but have not yet permeated work behavior throughout IST.

### **A wide variety of online tools are used for collaboration within IST**

In addition to team collaboration suites, many other types of online tools are used for collaborative work within IST. These include but are by no means limited to:

- Bug tracking
- Calendaring (example: CalAgenda)
- Change management systems
- Discussion forums
- Email (CalMail)
- File shares (Windows and Unix file servers, WebFiles)
- Instant messaging
- Knowledge bases

- Project management systems (Microsoft Project, including Gantt and PERT charts )
- Project Portfolio Management systems
- Ticketing systems
- Version control systems
- Web/video conferencing (WebEx)
- Weblogging ("blogging") tools
- Wikis

The use of email is ubiquitous, and file shares and calendaring are broadly used, as well. But there are also many cases where IST staff have found that their particular job requirements are well served by more specialized categories of collaborative tools. These specialized tools are "vertically-oriented," addressing particular needs in depth, as contrasted with general-purpose, "horizontal" tools used in collaborative activities such as email, calendaring, and file shares.

One illustrative example is the use by developers in Application Services and elsewhere within IST of several collaborative tools for software development and maintenance. To carry out this work, some IST staff are using a combination of JIRA (bug tracking) and Confluence (wiki) - commercial products from Atlassian Software Systems, along with a version control system for managing source code and auxiliary data, like Subversion or CVS. These products are relatively tightly integrated; for instance, the bug tracking system has direct access to the version control system's data on the history of changes ("commits") to files, and in turn the wiki has direct access to the bug tracking system's data regarding issues and tasks.

### **There are significant opportunities to leverage existing tools for collaboration**

Another conclusion identified in focus group discussions is that there are potentially overlooked opportunities for improving staff productivity using traditional tools. For instance, tools that make it easier to manage the flow of communications IST staff receive, such as the vast stream of email that comes into most of their inboxes daily, may deliver significant benefits.

Techniques such as as setting up email lists to automatically tag the subject lines of messages sent to project- or service-oriented mailing lists, and then setting up filters to automatically move those messages into project-specific mailboxes upon receipt, may be valuable to some staff who currently organize their mail in this way via time-consuming manual processes. Setting up automated mechanisms for removing a larger proportion of irrelevant "spam" messages from the email stream than is currently removed through default server-side filtering can provide similar value, as might techniques for sharing documents in shared repositories, rather than as email attachments. While many IST staff are aware of these techniques, others are not and would benefit by having well-documented techniques and tools available.

Offering training and documentation in the use of *existing* tools used in collaborative activities, such as email and calendaring products, may represent a quick, relatively low-cost and effective way of leveraging those tools to improve productivity.

### **Several common needs might be addressed through collaboration tool use**

IST staff told the project team about many of the frustrations they'd experienced when performing collaborative work using their current tools. Several of these frustrations are summarized below, along with some ways that team collaboration suites or different, standalone collaboration tools might help address them:

**Dealing with email "information overload."** Many IST staff have reported, both in the context of the project team's investigation, and elsewhere, of receiving far too much email. This is compounded by the practice in some IST units and workgroups of broadcasting messages received at role accounts or maillists to large numbers of staff members, so that they may be kept apprised of others' activities even if they are not directly involved with the matter at hand. Another major factor is the vast quantity of unsolicited bulk email ("spam") in the mail stream - representing 70-80% of all email messages, per recent estimates - only some of which is caught by server-side filtering; thus the remainder must be individually filtered or manually

discarded. Finding ways of sifting out and organizing actionable and valuable items - whether those items represent tasks to perform or monitor, investigations to be made, or information to store for later use - is taking an increasing amount of many staff members' work time.

Team collaboration suites can assist with this via features such as:

- Facilitating discussions of project work within the project context, via collaborative writing tools, discussion forums, and wikis, optionally gatewaying those discussions to email.
- Providing task assignment and tracking features that allow actionable items to be viewed and managed outside of the context of email, while optionally providing notifications via email that can be individually filtered on and given high priority.
- Automatically gathering and archiving email associated with project work, so that email specific to the project can be searched and referenced within a project workspace context. Notably, these archives can be particularly valuable for members who may join a project or service team after its inception.

**Providing better ways to store, share, and find documents.** Currently, there are too many places to store and later find documents, and not all of these are conducive to easily sharing those documents with others. These include local desktops - many with cluttered filesystems - and multiple file shares and web servers. In addition, another challenge is keeping up with changes to these documents over time, and ensuring that each project member is working with the latest version. One respondent described "days wandering around the file system" with no guidance during their first months of IST employment.

Team collaboration suites can assist with this via features such as:

- Storing documents pertinent to a particular project or an aspect of a service in a single online repository associated with the project or service.
- Providing version control of those documents.
- Offering full text and metadata-based searches for documents, both within and across projects.
- Automatically storing email file attachments as documents in the repository.

**Providing better ways to collaborate on documents.** There are a variety of situations within IST where multiple people must work together to create and edit documents. Currently, some of the methods used for doing so have some significant shortcomings. Often, each successive version of a document is stored on a file system, or sent via email attachments, and these are distinguished from one another only by filename - if that. As well, there is often no mechanism in place to help ensure that changes being made simultaneously by two or more people can be easily integrated.

Microsoft Word is widely used within IST to generate shared documents, and its Track Changes feature is often used as well. However, the project team heard frequently from IST staff that Word documents which have been heavily marked up by various authors and editors often become nearly unreadable. (This may also represent another opportunity to leverage existing tools via training, as Microsoft Word offers a feature that can temporarily hide this markup, displaying a consolidated view of a document. Recent versions of Word also offer versioning and merging features, but the staff interviewed by the project team did not mention that they were using these features.)

Team collaboration suites, as well as standalone collaborative writing tools, can assist with this via features such as:

- Providing collaborative online writing tools to make it possible to create and edit a document in a single location.
- Managing the individual revisions through version control features that facilitate work by multiple authors and editors. Depending on the suite and tool, these features may include:
  - Check-in and check-out of documents.
  - Providing notification and collision backout or merging options when two people have separately made simultaneous changes to a document.
  - Maintaining multiple document versions, including timestamping and authorship notation.
  - Offering the option to roll-back to a previous version.

- Providing the ability to readily compare changes between two versions.
- Offering simple ways to refer to, and embed links to, related documents.

## **There are multiple, overlapping collaboration tools and suites used within IST today**

Data pertinent to various projects and services within IST is stored in a myriad of places: on individual workstations; in local and server-hosted email mailboxes; in file shares, some which are specific to units or workgroups; and more recently, in a number of different Web-based environments, ranging from traditional web pages to wikis to team collaboration suites. Some of the challenges that this diverse environment poses to collaborative work have been discussed elsewhere within this report.

Even within the arena of team collaboration suites alone, there are at least three different products in use within IST. This multiplicity of suites:

- Requires that IST staff members learn how to use more than one team collaboration suite and their constituent tools. This makes it more difficult for these staff to remember how to perform basic functions in each, let alone to become proficient in the use of these suites and tools.
- Can impede sharing of data between groups which are using different suites and tools.
- Under some circumstances, can make it difficult to find documents or other resources which may be stored in multiple, different collaboration suite environments.
- Makes it necessary for these staff members to log into multiple project or service sites, sometimes with different usernames and passwords.
- For project site administrators, requires learning how to work with multiple administrative interfaces when setting up and maintaining project sites in each of the different collaboration suites.
- And more generally, diffuses resources that could go toward training and integration that could help make a collaboration suite product the cornerstone of some types of team collaborative work within IST.

However, because the use of these suites is relatively new to the organization, the project team also found that the experience of "team collaboration suite overload" is by no means universal: many IST staff have not yet worked with any such product, or have worked with only one so far, and so did not have any complaints about the multiplicity of tool suites. Nonetheless, a few staff who used only a single suite nonetheless found it frustrating that they needed to keep track of and visit multiple URLs, each representing a different project or service site relevant to a portion of their work. As one survey respondent wrote: *"I would like a one-stop shop starting point so I only need one bookmark or address to get started and I can then intuitively navigate to find what I need."*

In addition, several staff voiced their belief that having a large community using a common team collaboration suite, or a standard set of collaboration tools, might help create a "network effect" that could significantly benefit the organization's work environment. An analogy might be the use of CalAgenda for calendaring and scheduling: once most IST staff began maintaining their calendars in the same shared repository, it became far easier to schedule meetings and other events. This analogy isn't a perfect one, because project worksites - even within the environment of a single collaboration suite - are restricted spaces, typically accessible to only a relatively small number of participants. Nonetheless, knowing that a colleague with whom one might wish to collaborate has access to the same suite or tool is in itself beneficial, as it removes an initial barrier to working with them.

In the interim, while multiple suites are in use within IST - or if the organization ultimately decides to standardize on more than one team collaboration suite - some of these inefficiencies might be partially mitigated in various ways. For instance, at least two suites, BearShare and bSpace, both use common CalNet IDs and passphrases for authentication. In addition, suites that can inform project members when events occur - via mechanisms such as news feeds and email notifications - can make it less necessary to check project sites for updates. In this way, staff can find out about new documents or messages being added within the project workspace, or new tasks having been assigned to them, without having to visit project sites.

## **Practices - not just technology choices - are key to success when using collaboration tools**

## and suites

Notwithstanding whatever collaboration tools or tool suites might be available at any particular time for use by IST staff, adopting consistent practices around the introduction and use of those tools can go a long way toward fostering their acceptance and resulting in improved productivity from their use. These practices include:

- Training. Providing brief overview, orientation, and training sessions for teams using collaboration tools or team collaboration suites.
- Documentation. Developing quick start guides and other documentation for "up and running" use of these tools. Ensuring that online help is adequate for answering usage questions, and supplementing that help where necessary with local documentation.
- Naming conventions. Developing and adhering to naming conventions for documents and other resources.

In particular, training - even brief introductory training - can often elevate team members' familiarity with, and initial level of competence in the use of, tools in their team collaboration suites. The project team identified several instances where IST staff weren't aware of the existence of useful features of collaboration suites they regularly worked with, such as the Search feature in BearShare or the ability of bSpace to archive email messages within a project workspace. One focus group participant suggested that project managers could take twenty minutes at the start of project work to introduce team members to a collaborative tool, demonstrating its key features and how they should be used. With time, tool use will improve and 'best practices' will take root within the organization.

In addition, establishing and following naming conventions within project work - and perhaps even on a larger scale - can be extremely important, not only when using team collaborative tools but also when using traditional tools for collaboration. Practices as simple and non-technical as establishing conventions for email subject lines (example: <http://www.43folders.com/2005/09/19/writing-sensible-email-messages/>), and the naming of documents stored on file shares, can greatly facilitate group work. Creating simple "online practices style guides" for work teams, individual IST units, or perhaps for IST as a whole, might be one way of addressing this problem.

To identify and gather best practices within the context of team collaboration suites, one approach may be to interview managers and members from IST teams that have effectively used these suites in past projects, in order to identify practices which have contributed materially to success. Another may be to work with project management training activities to ensure that best practices being taught to IST project managers are reflected in collaboration tool or suite use.

To the extent that tools and team collaboration suites can automatically incorporate certain best practices in software behaviors or rules, so that they "just occur" without requiring conscious effort, this should be done. As one example, when bSpace receives an email message, it can automatically extract file attachments and make them available as document resources within the project workspace. In another example, BearShare allows the creation of project site templates which can be reused for new sites, and perhaps there may be an opportunity to embed certain desired practices directly into template designs.

## Each staff member organizes data in highly individual ways

Among the variety of reasons that email continues to be widely used as a collaborative tool, one is that it offers IST staff the ability to organize their data - placing it into mailboxes, and labeling, tagging, or sorting it - in ways that it individually makes the most sense for their personal style of work and their "mental maps" of the work to be done.

When using a team collaboration suite, the organization of shared data that is created by a project lead or site administrator may not always fit well with the ways that other members of that team organize their individual work. Allowing shared project data to be organized and viewed in individually customizable ways would be a desirable attribute of a team collaboration suite.

If a suite doesn't happen to offer "multiple views of the same data" capability internally, another way it can do so is to provide methods for externally accessing some of its data, allowing individual staff members to organize that data to their liking. For instance, some suites expose some of their internal data via RSS or Atom newsfeeds, WebDAV, web services, REST, or custom APIs. This allows staff to manage and interact with those feeds using online tools for aggregating and organizing information, such as portals, personalized home pages, and "dashboards". Some other ways through which collaboration suites may make data accessible to individuals, which they can then organize using their own criteria, include email notifications and exposing data via custom APIs.

In the project team's research to date, only a few IST staff are so far using these aggregation and organization tools, but those who have uniformly reported that they have been valuable in their work. A representative example of such a tool that was mentioned several times in focus group discussions is Netvibes, <http://www.netvibes.com>. These tools are primarily offered by so-called "Web 2.0" companies, and hence are subject to the gamut of issues regarding outsourcing: data security, ownership and the like, as well as the stability of the enterprises and applications in this space. This also presents an opportunity for potential development of a horizontal "personal information management" service within IST, perhaps in partnership with a company from the Web 2.0 space: one which would allow members of the campus community to flexibly organize information drawn from a wide variety of sources, using relatively lightweight data formats and protocols such as those mentioned above.

### **There is frequently a need to "get up and running quickly" at the onset of a project**

One of the themes that the project team heard most frequently from IST staff was that there is almost always a need to get teams working together quickly. There is little time available to set up a new project site, or to train participants in how to access it and use its tools. Ease of initial setup and administration, and the rapidness with which team participants can begin working within the environment, is of paramount importance.

This is particularly the case for some cross-departmental projects within IST, as well as certain collaborative activities involving members from a variety of campus departments, because often the participants are devoting only small slices of time from very busy schedules to those efforts.

There are at least four options for meeting this "need for speed":

- Select a suite which offers simple setup and administration and ease of initial learning.
- Provide templates that allow new projects to be quickly rolled out, if the suite offers this capability and it is found adequate for accelerating project site rollout.
- "Clone" an existing project, cleaning out data but preserving structure, if the suite allows this, as well.
- Standardize on the use of two different team collaboration suites within IST.

Regarding the latter option, it is possible that subsequent investigation may identify a promising suite product which is richly featured but requires a considerable degree of learning, setup, and configuration work on the part of a site administrator, and perhaps also presents a somewhat steep learning curve for project team members. If so, a second suite, which can be up and running more quickly, and that may also offer simpler, more limited features, might be offered as an alternative.

If this option were chosen, it would also be necessary to clearly define the circumstances for which each of the two suites is most suited; integration bridges between them may also need to be provided. This option should be considered only if no single suite can meet both provide the full set of features required and also facilitate "up and running quickly" scenarios.

### **Understanding collaborative behaviors can guide tool investment**

IST staff collaborate frequently in their day to day work. This occurs both face-to-face and through many channels of electronically mediated communication. Because of this, the organization may have many opportunities to benefit, by focusing resources and effort on helping its members work more productively in

particular collaborative contexts.

When deciding on tools to enhance collaborative work, it is important to start by understanding the processes that make up the interaction, before considering which tools to adopt to support those processes. The Gartner Group suggests that organizations can maximize the value of limited resources by understanding these behaviors and - rather than supporting 'collaboration' in general - directing investment towards tools and practices to support the processes that bring the greatest benefit.

## Roles

Every IST staff member needs to communicate and collaborate on work with others in the organization. However, there are often collaboration needs that are specific to the type of work that each person performs.

Via focus group discussions, a number of composite roles began to emerge. People whose jobs closely match these roles appear to use collaboration tools and suites in distinct ways. (Because of the myriad job duties performed by IST staff, these roles encompass only a representative sampling of the total work performed within the organization.)

**Roles targeted by team collaboration suites.** The roles which appear to be the most suitable target for team collaboration suites are those of Project Leads and Service Managers, and of Project and Service Team Members:

### Project Leads and Service Managers

Some representative examples of typical processes performed by staff acting in this role include:

- Communicating project goals.
- Tracking progress toward milestones.
- Obtaining early warning of external deadlines and activities, or potential risks, that may impact delivery times, cost estimates, or quality objectives.
- Assigning tasks and maintaining an overview of their completion status.
- Managing resources required by the project or service.
- Understanding risk factors related to project or service success.
- Interacting with customer stakeholders to understand their needs and ensure they are being met.
- Interacting with customer stakeholders to carry out various processes requiring their involvement.
- Creating, modifying, referencing planning and technical documents pertinent to the project or service.

Some representative types of collaboration tools used by staff acting in this role are:

- Collaborative writing
- Document sharing

### Project and Service Team Members

Some representative examples of typical processes performed by staff acting in this role include:

- Understanding and contributing toward development of project or service goals.
- Understanding project milestones and their status.
- Knowing current task assignments and those of peers, as well as being able to hand off assignments or parts of multi-part task processes (with the consent of leads and managers, or peers).
- Interacting with customer stakeholders to understand their needs and ensure they are being met.
- Interacting with customer stakeholders to carry out various processes requiring their involvement.
- Creating, modifying, referencing planning and technical documents pertinent to the project or service.

Some representative types of collaboration tools used by staff acting in this role are:

- Collaborative writing

- Document sharing
- Task assignment and tracking
- Time tracking

**Other roles.** In addition to these two composite roles, a number of other roles emerged during the project team's work. Some simplified examples of these roles follow. These capture only part of the rich tapestry of work carried out in each of these roles, as well as by IST staff in general:

### **Communications/Editorial/Web Content**

Some representative examples of typical processes performed by staff acting in this role include:

- Designing web content.
- Editing web pages.
- Identifying visitor personas.

Some representative types of collaboration tools used by staff acting in this role are:

- Collaborative writing

### **Service or Help Desk Consultants**

Some representative examples of typical processes performed by staff acting in this role include:

- Making sure that customer issues are resolved in a timely manner.
- Asking questions of, and referring questions to, peers and subject experts.
- Maintaining and accessing the history of issues related to specific customers.

Some representative types of collaboration tools used by staff acting in this role are:

- Instant messaging tools
- Ticketing systems

### **Field Technicians (network/telephone/workstation)**

Some representative examples of typical processes performed by staff acting in this role include:

- Receiving timely work orders for installations and repairs/fixes.
- Maintaining and accessing the history of issues related to specific customers and sites.
- Accessing building plans: floor layouts, conduits, wiring (electrical, telephony, networking), emergency exits.

Some representative types of collaboration tools used by staff acting in this role are:

- Document sharing
- Ticketing systems

These technicians also often rely heavily on email, voicemail, and text paging for communications, and on work order systems.

### **Programmers**

Some representative examples of typical processes performed by staff acting in this role, that team collaboration suites and other collaborative tools may often be able to assist with, include:

- Creating and maintaining source code and auxiliary files, such as configuration and data files.
- Identifying bugs, assigning and completing fixes.
- Interacting frequently with customers regarding feature requests, bugs, and timetables.

- Tracking time spent working on a recharge basis for various customers.

Some representative types of collaboration tools used by staff acting in this role are:

- Bug tracking systems
- Discussion forums
- Document sharing
- Ticketing systems
- Time tracking tools
- Version control systems

## **System administrators and database administrators**

Some representative examples of typical processes performed by staff acting in this role include:

- Maintaining standards and practices, which are often accountable to auditing.
- Documenting initial installation and configuration, and subsequent changes, including the specific changes performed and the reasons for same.
- Making sure that customer requests for service and changes are resolved in a timely manner.

Some representative types of collaboration tools used by staff acting in this role are:

- Change management systems
- Collaborative writing tools, particularly wikis
- Document sharing
- Ticketing systems
- Version control systems

## **"Thought Leaders"**

Some representative examples of typical processes performed by staff acting in this role, that team collaboration suites and other collaborative tools may often be able to assist with, include:

- Need to share concepts and other ideas with peers

Some representative types of collaboration tools used by staff acting in this role are:

- Blogging tools
- Collaborative writing tools

## **Team collaboration suites**

The focus of this investigation has been on "team collaboration suites." These online applications provide workspace repositories in which team data can be collected, organized, and manipulated using a collection of tools.

Team collaboration suites are particularly suited to situations where the members of a project team need a site that can store and organize all or a great deal of the information that relates to the project. These suites can also be suitable for a group responsible for running a small service or a manageably-sized portion of a larger service. In addition to facilitating collaboration between IST teams, some suites can also accommodate participation by members who are non-IST customers or partners.

Several different team collaboration suite products are currently in use within IST. Given the short timeframe of this project, the project team's focus has been on tools with which IST staff have already had experience, particularly team collaboration applications hosted within IST or elsewhere on the Berkeley campus. However, many other collaboration tools exist in the marketplace, ranging from standalone products to integrations of two or three products, to full-fledged collaboration suites, and this is an area in which products are rapidly

emerging and evolving.

Industry analysts at firms such as Forrester Research and The Gartner Group have surveyed this space and predicted where the marketplace is headed. According to one recent research report, one of the most significant trends in collaborative software is a move by major vendors, such as Microsoft, IBM, and Oracle, to bundle their products into collaboration platforms, by folding messaging (examples: email and calendaring) and real-time collaboration (instant messaging and video conferencing) in with other tools (collaborative writing) designed to facilitate group collaboration. Those enterprise-scale platforms vastly exceed the scope of the products being addressed by the current project, but bear watching over time.

Another readily apparent trend is the emergence of online office applications and suites, which offer online text editing or word processing, spreadsheet, and presentation applications, for example, and aim to make inroads into the current, near-ubiquitous use of Microsoft Office. To gain a compelling advantage over Office, these office applications and suites provide a variety of collaborative features which may facilitate teamwork; however, they also do not fall within the scope of the current project.

### **Tools bundled into team collaboration suites**

The following are some examples of the types of collaboration tools which may be bundled into team collaboration suites:

- Blogging\*
- Calendaring
- Collaborative writing:
  - Collaborative text editors, word processors, and 'whiteboards'
  - Wikis
- Discussion forums
- Document sharing
- Email archives
- Instant messaging
- Milestone tracking
- Project management
- Time tracking
- Task assignment and tracking/ToDo lists

Most team collaboration suites incorporate only a subset of the many tools listed above; most also offer some degree of integration between some or all of the included tools.

\*Blogging tools have not traditionally been included in team collaboration suites, but the next major release of Microsoft SharePoint Services is slated to include blogging capabilities.

### **Team collaboration suites in use in IST**

At the outset, the project team identified three team collaboration tool suites used within IST:

- BearShare, based on Microsoft Windows SharePoint Portal and SharePoint Services, and hosted by IST.
- bSpace, based on Sakai, an open source learning management system that includes some generic team collaboration features. bSpace is hosted by the campus's Educational Technology Services (ETS).
- Basecamp, hosted by 37signals, a commercial service.

The selection of these tools was made on an *ad hoc* basis. There is currently no mandate within IST as a whole that these tool suites be used, nor any requirements for the selection of any particular tool suite. There are clusters of usage of each tool suite within the organization, as well as champions of and dissatisfied users of each.

The following are summaries of the usage of each tool suite within the organization, the primary tool or tools used within those suites, and prominent likes and dislikes elicited from users of these suites. In addition, the

hosting status of each tool is discussed.

## BearShare

As described in a recent article (<http://istpub.berkeley.edu:4201/bcc/Spring2006/884.html>), "BearShare (<http://aboutbearshare.berkeley.edu/>) is UC Berkeley's implementation of Microsoft's SharePoint technologies," hosted by IST in the Data Center. "BearShare allows users to easily create, manage, and build collaborative websites and make them available to other users of BearShare. BearShare sites facilitate collaboration on documents, tasks, contacts, events, and other information. BearShare sites are available on a recharge basis."

Another recent article (<http://istpub.berkeley.edu:4201/bcc/Spring2006/770.html>) announced the availability of the BearShare service to the entire campus - not just for internal IST use - in Fall 2005. Setting up a project site with a default allocation of disk space costs \$300, and includes an initial orientation and five hours of consulting. Each participant must also have a Microsoft client access license.

**Usage within IST.** Based on responses to the project team's survey and focus group discussions, BearShare is the team collaboration suite that is most widely used within IST. 12 out of 27 (44.5%) of the respondents to the survey indicated that BearShare was their "most used" tool, and another respondent used BearShare and Basecamp equally.

This result is consistent with what the project team learned from the Gartner Group analyst: SharePoint is by far the most widely used team collaboration suite at the higher education customer sites she has worked with, both in North America and the UK.

**Primary uses of BearShare.** Of the 13 total survey respondents who cited BearShare as their most used (or equally most used) team collaboration suite, nine said their most frequent use of BearShare was for document sharing, two cited todo lists, one said they used BearShare primarily for both of those purposes, and one primarily used discussion forums.

Although SharePoint Services encompasses a diverse set of tools for carrying out collaborative work, such as discussion groups and calendaring, document sharing has clearly been the focal point of its use within IST to date. That's not an accident, as Microsoft has positioned SharePoint as a potentially superior replacement to traditional file stores, summarizing some of its advantages at <http://www.microsoft.com/technet/windowsserver/sharepoint/V2/fsdoclib.mspx>. (Although providing version control for documents is not mentioned in that article, that is also another key advantage of SharePoint over standard file shares.)

**Likes and strengths, dislikes and limitations of BearShare.** Possibly a product of the widespread use of BearShare within the organization, there were also many complaints regarding this suite, with many more negative impressions than positive being registered in the focus groups and survey. A significant percentage of these complaints appear to be related to transient implementation details regarding the current version of the service, or configuration choices made by project site administrators, and notations below attempt to highlight where this may be the case. It should also be noted that several staff reported significantly positive experiences with BearShare, and the suite has some strong advocates within IST, some of whom find it indispensable to their work.

Also of considerable importance when reviewing the lists below, Microsoft is scheduled to introduce a major new version of SharePoint Services, which has the potential to address some, perhaps many, of the issues mentioned here.

Some likes and strengths:

- For Windows users, integration with Microsoft Office applications, such as Word and Excel. Users can open documents from BearShare's document library, edit them, and save them back into the library; in that process, check-out and check-in is handled automatically.
- Integrates with CalNet authentication.

Some dislikes and limitations:

- Setting up a new site requires an administrator who is willing to put some time and thought into site organization and permissions.
- Some users are shown a large list of documents pertaining to many projects, not just their own.
- Some users can view only the document they've been referred to, and can't "browse up" to view a list of other documents in the document library or other parts of the project site. (This and the previous issue are both related to the choices made by site administrators when they set access permissions. SharePoint offers relatively granular control over these permissions, and this will become even more granular in the next release, based on SharePoint Services 2007.)
- Some users must repeatedly enter their authentication credentials, not only when initially logging in but again when performing various actions within the BearShare environment. (This is apparently due to an issue related to Kerberos authentication, and is amenable to resolution.)
- Non-Windows users experience degraded functionality. For instance, Macintosh users have experienced problems checking in new versions of documents, having to add them under a different name rather than checking in a new version on top of an old one. (Microsoft's next major version of the underlying product, SharePoint Services 2007, aims to significantly improve functionality for non-Windows users.)
- A user can easily open and make changes to a document, without remembering to formally check out that document. After doing so, they can't check the changed document back in under the same name. (A workaround might be to then check out the document and paste in the changed, non-check-out version.)
- Online help is not helpful: it can be difficult to find answers to questions or tips on how to perform various tasks. (This is apparently in part due to a discrepancy in online help documentation related to two different SharePoint technologies.)
- Email notifications can be intrusive. A project site can be set up to send email notifications when events occur, such as a new version of a document having been uploaded to a library. However, several users who have enabled this feature described it as having generated far too many email messages.
- Restores from backup currently require a multiple step, labor intensive process on the part of the service administrator.

## bSpace

As described in a recent article (<http://istpub.berkeley.edu:4201/bcc/Spring2006/884.html>), "bSpace is UC Berkeley's new collaboration and learning environment available free of charge to faculty and students for use in their teaching and learning and research collaborations. BSpace allows users to create project or course sites, which then have a number of interactive tools available such as a discussion forum, synchronous chat space, wiki, assignments tool, quizzing and surveys tool, schedule tool, a resources space for documents, and more. Learn more about bSpace at <http://ets.berkeley.edu/LearningSystems/bspace/>." Use of bSpace is free of charge to campus affiliates.

bSpace is an implementation of Sakai, an open source initiative to develop a collaboration and learning environment for education. Sakai is written in Java, and consists of a core framework and individual tools created by community developers. Berkeley's participation in contributing to the development of Sakai, including its Gradebook module and work on several other parts of the project, is described in another recent article, <http://istpub.berkeley.edu:4201/bcc/Fall2005/665.html>.

On the Berkeley campus, the bSpace application is managed by Educational Technology Services (ETS). It was first rolled out for campus use in Fall 2005, but broad campus adoption began during the Spring 2006 semester, continuing through Fall 2006. Over time, bSpace is slated to replace two legacy systems, Blackboard and WebCT.

**Usage within IST.** Although bSpace's focus is on providing tools to instructors and students for use in teaching, learning, and research, staff in IST and elsewhere have discovered that it offers several tools which, in combination, can also make it serve as a functional team collaboration suite in other environments, as well.

None of the 27 respondents to the survey indicated that that bSpace was their most-used team collaboration

suite. However, several staff who participated in focus groups mentioned that they had already been involved in a number of uses of bSpace, particularly in collaborative efforts involving staff across multiple campus departments. Two representative examples were committee work on web accessibility and staff projects associated with the Leadership Development Program. bSpace was described as free, available to all members, and one in which it was relatively quick and easy to get a site up and running.

**Primary uses of bSpace.** The tools which bSpace users told us they most used were collaborative writing (wiki) and document sharing.

#### **Likes and strengths, dislikes and limitations of bSpace.**

Some likes and strengths:

- Integrates with CalNet Authentication.
- Ability to get up and running quickly: rudimentary project sites can be set up quickly.

Some dislikes and limitations:

- Limitations on the ability to delegate administration. Related to that, each user must have a CalNet ID, so role accounts can't be used to administer project sites.
- Limitations on the granularity of access permissions.
- Within the wiki tool, renaming a linked-to document can render it inaccessible.
- Within the wiki tool, the editing field is small, even on a large computer screen.
- No version control for shared documents (referred to in bSpace as "resources").
- No task tracking or assignment features.

## **Basecamp**

Basecamp is a lightweight team collaboration suite hosted by an application software provider, 37signals LLC. It is representative of a number of such applications which have arisen in the so-called "Web 2.0" space, and is based on Ruby on Rails and AJAX technologies. Licenses for setting up project sites in Basecamp have been purchased from the vendor over time by various IST departments. Current pricing (<http://everything.basecamp.com/archives/000300.php>) ranges from approximately \$25 per month for up to 15 project sites to approximately \$100 per month for unlimited sites.

Basecamp appears to be primarily positioned at creative services teams, such as web designers, who have a need to "quickly create client/project extranets." In this regard, Basecamp is somewhat similar to bSpace: although neither suite is specifically aimed at internal project or service team work within large enterprises, both include features that make them suitable for handling some of that work.

**Usage within IST.** Based on responses to the project team's survey and focus group discussions, Basecamp is the team collaboration suite that is the second most widely used within IST. 6 out of 27 (22%) of the respondents to the survey indicated that BearShare was their "most used" tool, and another respondent used Basecamp and BearShare equally.

**Primary uses of Basecamp.** Of the 7 total survey respondents who cited Basecamp as their most used (or equally most used) team collaboration suite, three noted their most frequent use of Basecamp was for todo lists and/or milestone tracking, and one said they used Basecamp primarily for both of those purposes.

#### **Likes and strengths, dislikes and limitations of Basecamp.**

Some likes and strengths:

- Ability to get up and running quickly: rudimentary project sites can be set up quickly.
- Site structure - including categories for messages, new to-do lists, and the like - can be set up and changed on the fly.
- Ability to offer access to selected non-IST or non-University guests.

Some dislikes and limitations:

- No apparent ability to integrate with CalNet authentication (AWS and its successor) or LDAP-based users, groups, and roles.
- Must repeatedly create user accounts and groups in each new project site.
- Limitations on the ability to delegate administration.
- Access permissions are generally limited to two levels: site administrator and user. Site administrators have full access to all projects within a site, even those which are not their own.
- Potential to lose unsaved data as a result of session timeouts.
- The collaborative writing tool ("writeboard") has some significant limitations.

Overall, Basecamp's feature set is limited by design. The vendor's philosophy is to offer a relatively spartan set of basic functionality, only occasionally adding modest feature enhancements. While this facilitates ease of initial learning and ongoing use, this also means the suite may "run out of gas" for some uses. This contrasts with BearShare, where Microsoft plans to aggressively add and enhance features in a forthcoming major version of its underlying SharePoint software; and bSpace, where higher ed institutions participating in the Sakai consortium have so far been active in adding major new tools and enhancing existing tools.

### **Team collaboration suites are often used in two different modes: for coordinating and conducting work, and for information sharing**

Relative to team collaboration suites, there are three categories of collaborative processes within IST:

- Processes which are carried out solely using one or more task-specific collaboration tools, such as those listed above. (In at least a few cases, it should be noted that a different task-specific tool or tools may ultimately turn out to be even more suitable for carrying out those processes than the current tools in use.)
- Processes which are, or can be, carried out solely using a team collaboration suite.
- Processes which are, or can be, carried out using a team collaboration suite, but only when used in combination with other task-specific tools.

For the second and third categories above - collaborative processes which can be wholly or partly carried out using team collaboration suites - the project team observed that there appear to be two primary "modes" in which these suites have so far been used within IST:

- Predominantly for coordinating work and sometimes also directly generating work product, often on the part of staff peers and managers who are directly engaged in project or operational work. Examples of these uses include assigning tasks and tracking their progress, and doing collaborative writing.
- Predominantly for information sharing, often on the part of Directors and managers acting in leadership roles. Examples of these uses include sharing strategy, planning, implementation, and technical documents; tracking major milestones across multiple units or teams; and "broadcasting" messages to unit or team members.

There have been some uses of team collaboration suites in certain project, service, and unit contexts in which both modes are used, but frequently one mode or the other is predominant.

### **Requirements for team collaboration suites**

#### **Technical requirements**

The project team identified that a team collaboration suite will ideally meet the following technical requirements in order to be considered for standardization:

- Make it possible to extract data for migration to a successor suite or tool.
- Use open, documented, and well-defined data formats, or be capable of exporting in those formats. (An example from Microsoft's Visio drawing application would be the use of the open, XML-based .vsx format

rather than the proprietary .vsd format.)

- Be based on current and industry-standard architectures, best practices, and data and metadata formats.
- Offer reasonably complete functionality to users of multiple computing platforms, operating systems and web browsers.
- Be easy to use by a wide range of users, with "ease of use" encompassing accessibility, ease of initial use (learning), and ease of ongoing use (efficiency).
- Have the ability to programmatically integrate with other suites or tools, through news feeds, APIs, WebDAV, or other integration "hooks,"
- Integrate with CalNet authentication and directory services.
- Offer a straightforward mechanism for recovery of lost data from backup, ideally by users or site administrators.
- Be capable of archiving project sites.

## **Licensing, hosting, and support requirements**

Key licensing, hosting, and support requirements include:

- Have support contracts available, either from the vendor or from a third party.
- Be capable of being hosted by UC Berkeley, or if offered through a hosted service, offer a licensing fee structure which allows for wide use throughout the organization.

## **Feature requirements**

In addition to technical requirements, the project team identified a number of key features to evaluate when making product recommendations. These are "horizontal", cross-suite features, rather than being specific to a particular tool:

- Offer the capability to create skeletal site templates, which can be replicated when setting up new sites.
- Provide the ability for a site administrator to delegate administrative tasks, such as the creation of new project or sub-project sites and management of user accounts.
- Provide integral version control for all relevant tools, including document sharing and collaborative writing.

## **Blogging tools**

As an additional requirement, added by the IST Directors after the project began its work, the project team has been asked to look at weblogging (or "blogging") tools.

While weblogs are considered by the consulting firm The Burton Group to be a communication tool rather than a collaboration tool, a blog can nonetheless be used to share ideas within a defined group, or by taking advantage of linking and trackback functions within a more loosely connected 'community of practice.'

Today, blogging tools are typically standalone online applications, although the next major release of at least one team collaboration suite will also incorporate blogging capabilities.

Before the project began, several members independently worked with Chris Ashley to look at several leading hosted blogging tools to identify which might be suitable for the One IST website. Chris ultimately selected Six Apart's Moveable Type. When others in IST began visibly using Moveable Type for organizational blogs, it became clear, spurred in part by staff comments received by the Transition Team, that a broader investigation of blogging tools was needed prior to wider adoption of such tools within IST.

In the user research conducted by the team, with one exception - an IST Director - no other respondents mentioned that they were currently using blogging tools in the context of their work for IST, and no one who was not currently using such tools asked about their potential availability. This is because the use of these tools with IST - largely for the One IST website and for at least one departmental newsletter - is still relatively

new, having been introduced less than two months ago.

To date, the project team has focused on user requirements for team collaboration tools, and has not yet devoted much time to exploring this category of tools.

## **Next steps**

Some recommended next steps for successor project work:

### **Incorporate findings from underrepresented areas of IST**

Some 10% of IST staff voluntarily participated in the online survey, attended focus groups, or were individually interviewed regarding their use of collaborative tools in their IST work. Because of this limited sampling size, and particularly because participation was strictly voluntary - given the considerable workloads of IST staff during a time of transition to a new organizational model - some groups were clearly underrepresented in this sampling, relative to their number in the organization.

These groups included business services staff and staff in administrative support positions, as well as technical staff engaged in software development and maintenance, systems administration, database administration, data modelling and reporting, and desktop support roles, as well as managers in those areas. It is entirely possible that the project team did not capture the full richness of the collaborative environments, practices, and needs of people who work in those environments.

In addition, there were a number of individuals identified by the project proposal as stakeholders who have not been individually interviewed in depth, including several directors and managers, and a number of other interview candidates emerged as well over time. Several non-IST staff members of a campus business processes user group also volunteered to share their experiences with team collaboration suites, and their unique perspectives would be valuable to capture, as they may help expose some issues from the perspective of campus customers and partners who work with IST.

For this reason, comments from members of those groups on draft versions of this project report are eagerly solicited. The project team also suggests that any successor project continue data gathering to ensure that those groups' input is incorporated.

### **Identify candidate suites for further evaluation**

A successor project will need to develop a "short list" of team collaboration suites for further evaluation, with the ultimate goal of identifying through a set of evaluation activities whether team collaboration work in IST can be effectively carried out using only one - or at most two - such suites.

The three team collaboration suites listed above are obvious candidates. In addition, the successor project should evaluate:

- The next major release of Microsoft's SharePoint (on which BearShare is based), SharePoint Services 2007.
- At least one or two Web-hosted candidate suites.

The current project initially amassed a list of over ten Web-hosted suite products, both from its own research and through suggestions from IST staff, which can be used as a starting point for further investigation in a successor project.

Evaluation activities should include:

- The extent to which each of the candidate suite products meets the suggested technical, licensing, and feature requirements listed above.
- Identifying the "fit" of each candidate suite product with team scenarios and high value collaborative processes, as described in the next two steps, below.

## **Develop team scenarios for use in the evaluation**

Develop scenarios which capture the range of meaningful differences between team collaboration contexts, if any may exist, and within which the suitability of each suite might be evaluated. These could potentially include:

- A small team versus a large team or unit.
- A team consisting entirely of IST staff participants versus a team consisting of both IST and non-IST participants, potentially including some members for whom CalNet authentication may not be available.
- A short-term project versus an ongoing service team. For instance, a short-term project might need to get "up and running" on a project site within a few hours after onset, and its features may need to be simple enough for its members to begin using immediately; while an ongoing service might instead need to deal with the need to periodically prune and archive obsolete data.
- A workspace which is primarily used to share information, such as milestones and documents, versus one which is primarily used for active collaboration, such as collaborative writing and task assignment and tracking.

## **Identify high value collaborative processes for use in the evaluation**

Identify which collaborative processes, including those described above, are of high value to IST collaborative work, and need to be well-supported by tools and integration features in a team collaboration suite.

"High value" collaborative processes can be those which are performed widely throughout the organization, and thus touch the day-to-day work lives of most IST staff. They can also be processes which, although performed less commonly, are of critical significance in IST's ability to provide service to its customers.

Although processes which pertain to the broadly-defined work roles of project lead or service team manager, and that of their team members, are usually those targeted by team collaboration suites, it is also possible that a suite may provide a solution in the context of a smaller set of work roles, or even a single work role, and those opportunities should be recognized and further explored.

## **Conduct a team collaboration tools suite "bakeoff"**

After identifying candidate suites against the technical, licensing, and feature criteria listed above, the candidate suites should be evaluated against one another in a "bakeoff" to determine whether, and if so which, collaborative tools suite or suites should be recommended for the IST collaborative toolkit.

After two or three top candidates are selected, two examples of potential approaches to conducting the "bakeoff" include:

- Preparing a reviewers guide containing a detailed, sequential workflow of tasks typical of the scenarios and high value collaborative processes identified above, which should then be performed in parallel in each candidate suite.
- Using each of the candidate suites in parallel in the context of similar, real-world IST projects.