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FACILITATING CROSS-AGENCY COLLABORATION

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Executive Summary

This report is aimed at managing partner agencies and program managers who are engaged in the planning and execution of the e-Government initiatives. Focused on facilitating collaboration, it approaches collaborative efforts through the lens of teamwork, and it answers the following questions:

- How are highly effective teams designed?
- What are characteristics of highly effective collaborative teams?
- How are highly effective teams supported?

For managing partners, the report provides ideas for supporting program managers and their teams. It recommends several approaches, including proposals for centralized resources, and it outlines areas for further review, including a detailed assessment of collaborative software.

For program managers, the report suggests a method for designing an effective team and it outlines a host of best practices to serve as guideposts while planning and executing an initiative.

The central thesis of this report is that these initiatives require collaboration on an unprecedented level, and that collaboration demands highly effective teams. Of course, rather than serve as the final word on teams, it should operate as a "playbook" with suggestions and options for team design, management, processes and support.

Successful collaboration depends on highly effective teams. In recognition of the extraordinary tasks facing the managing partners and program managers, we offer suggestions and considerations to aid initiative delivery.

To support these teams, we recommend Teamcenter, produced by Inovie, Incorporated if it is feasible to choose only one product to be used by all teams. Reasons to choose a single product include a need for cross-team collaboration as well as cost issues. However, each of the nine products we reviewed offer unique value propositions, and, if it is feasible for each team to use its own product, we provide tools to help managing partners identify the best fit for their teams.

Introduction

From the Oval Office to the citizenry, expectations of electronic government run high. Named earlier in the year as one of the five key elements of the President's Management and Performance Plan, e-government has taken top priority in 2001. The Office of Management and Budget has moved quickly to achieve e-government's promises. Within the final six months of 2001, OMB has:

- Hired Mark Forman as the Associate Director for Information Technology and e-Government *(June 2001)*
- Established and concluded an e-Government Task Force, under Forman's direction, to identify high-payoff e-government opportunities *(July 2001)*
- Identified 23 e-Government opportunities *(Oct. 2001)*
- Assigned each initiative to a "managing partner" agency *(Oct. 2001)*
- Appointed "program managers" to lead each initiative *(Oct. 2001)*
- Reorganized the federal CIO council to include three committees – best practices and capital planning, architecture and IT workforce – and several portfolio management teams to focus on service to citizens, to businesses, to other government entities and within the federal government *(Oct. 2001)*
- Obtained detailed "business cases" from each initiative's manager *(Dec. 2001)*

Not surprisingly, the pace of change has been rapid and its impact significant. Newly appointed managing partner agencies and program managers have been asked to deliver the initiatives within the next two years, and each has responded with detailed business cases.

This paper was commissioned by the Office of Electronic Government within the General Services Administration (GSA) as part of an overall effort to facilitate cross-agency collaborations. Its research coincided with Mark Forman's e-Government Task Force that identified 23 high potential e-Government initiatives in October 2001 for implementation. As a result, since GSA was assigned managing partner responsibility for five of the initiatives, the project re-focused on planning and supporting initiative collaboration.

The authors interviewed five key leaders within the GSA-managed initiatives. We would like to thank Steve Timchak, Tom Freebairn, Timothy Burke, Lew Sanford and Becky Rhodes for their assistance. During our interviews, several mentioned that the project teams have yet to be organized formally. One had an idea of a core team comprised of "no more than 10 people." Another indicated a core team of 15 members. Yet another mentioned a huge project scope. In addition, it appeared that outside contractors are under active consideration. Thus, the idea of collaboration through teaming took root, and became the fundamental topic of study.

Challenges

Traditional organizational models and project management methodologies often fail to deliver results in complex, distributed, multi-enterprise initiatives. Conventional "command and control" management practices face increasing challenges in handling virtual teams, compressed delivery times and new demands for efficiency. New institutional behaviors are demanded to meet timeline and budget targets.

The federal government, with its e-Government initiatives, seeks to transform its operation. Of course, such a task involves complex variables, including agency politics, reporting structures, funding and budgetary issues. Certainly, traditional agency structures, and the concomitant cultural "stovepipes," were designed to facilitate delivery of a single service not to facilitate cross-agency collaboration. As agency resources are reallocated, there is increasing dependency on collaboration to optimize government efficiency as opposed to agency efficiency. The current effort is to 'unify and simplify' lines of business to better meet the needs and demands of federal state, and local government, as well as those of citizens and businesses. (Bush Memorandum, 2001)

Considerations

Achieving the strategic goals of each initiative, both singly and collectively, requires managing complexity. On one level, strong and proven program managers have been chosen to lead the efforts. On another level, all are being asked to manage cross-agency collaboration on an unprecedented plane.

What to expect

The central thesis of this report is that these initiatives require collaboration on an unprecedented level, and that collaboration demands highly effective teams.

For managing partners, the report provides ideas for supporting program managers and their teams. It recommends several approaches, including proposals for centralized resources, and it outlines areas for further review, including a detailed assessment of collaborative software.

For program managers, the report suggests a method for designing an effective team and it outlines a host of best practices to serve as guideposts while planning and executing an initiative.

Framework

Collaboration entails the highest degree of multidiscipline integration and interaction. Lack of communication, divergent interests, unclear decision-making processes and poor governance hinder team efforts of all shapes and sizes.

Certainly, technology has had a dramatic impact on how people work, especially with the advent of distributed computing in the Internet age. On one hand, resources have been dispersed and face-to-face communication reduced. Yet, technology also brings the best resources together virtually, and it allows teams scattered across the globe to tackle common problems and projects.

Studies suggest that successful collaborations require careful planning. One pair of commentators notes that collaboration requires careful consideration to be given "to the scope of the effort, stakeholders and members, how the results of the work will be applied, limitations, timeframe, and expectations of the sponsor of the collaboration" (Chiat and Mickiewicz, 1999). With regard to the e-Government initiatives substantial planning has already occurred.

Each project has a business case that pinpoints the variables cited above, with the notable exception of identifying project members. As discussed later in detail, each project team will need a shared vision and clear understanding of the objectives in order to foster effective collaboration.

To address the specific requests of the Office of Electronic Government, we have divided this paper into two main sections:

I. **Team Issues:** We have identified four segments of team issues: (i) team design, (ii) team management, (iii) team processes and (iv) team support. This section of the paper offers suggestions for organizing, best practices to incorporate, and ideas for team support.

II. **Web-based collaborative software:** In this section we provide an analysis of leading web-based collaborative tools, and offer a discussion on how these types of tools support and address the four components of organizational issues.

Four Components of Team Issues

We have identified four team issues, including design, management structure and processes. In addition, highly effective teams are characterized by strong levels of team support, especially in areas of resource allocation and collaborative training. Another element emerging as a key enabler of team success involves collaborative software. Figure 1 highlights the areas covered in this section.

Team Design	Team Management	Team Processes	Team Support
• A modular approach to organizational design *(adapted to the e-Government initiatives)* • Team Attributes	• Reporting • Appraisal	• Place • Sequences	• Resources • Collaborative training • Software

Figure 1: Four components of organizational issues

I. Team Design

The Modular Approach to Organizational Design

A unique approach to organizational design was developed recently by Agarwal and Sambamurthy (2001). While their research focused primarily on organizing I/T functions, we have adapted its five-step process to building teams in the context of the e-Government initiatives. It provides a useful tool to managers seeking optimal team design because it organizes around activities and expected capabilities.

Applying a "modular approach" is at the core of the Agarwal and Sambamurthy process. They suggest that the modular organization, comprised of fundamental "building blocks," speeds project delivery, enhances innovation and promotes adaptability to change (2001). The following section on team design borrows liberally from their research and findings and it has been adjusted to fit the unique environment of the e-Government initiatives. The five-step process, useful for both program managers and managing partners, follows on the next page:

Step 1: Identify the critical activities and capabilities expected of the team.

Activities should be identified, and then separated into the primary and secondary categories outlined in Figure 2. Primary activities are defined as the core activities required by the project, such as delivering the solution or set of solutions. Secondary activities may be described as support activities like budgeting or contract management. Furthermore, the researchers recommend that expected capabilities be categorized under the headings "infrastructure, knowledge *(IT human capital and technical skills)* and relationships *(networking with…executive management, dispersed IT staff and external IT partners)"* (2001, pg 5).

Regarding the e-Government initiatives, we suggest that primary activities be characterized in terms of what Agarwal and Sambamurthy call "solutions delivery" or "services provisioning." Secondary activities can be grouped under a number of headings including finance, contract management or other support function. Figure 2 defines the core primary and secondary activities as well as the suggested capabilities in greater detail.

Primary Activities	
Solutions Delivery	Analysis of business needs, conceptualizing applications, and delivering the applications either through internal development, external contracting, or through solutions integration of packaged software
Services Provisioning	The provisioning of utilities, such as data center, and services, such as helpdesk or desktop management, for the users across the initiative
Secondary Activities (Can be modified to include other support functions)	
Financial Management	Includes management of OMB filings, budgeting and other items
Contract Management	Includes structuring contracts, developing statements of work and other items
Capabilities	
Knowledge (includes human capital)	The know-how possessed by team members in terms of technology competency and business knowledge
Infrastructure	Includes establishment and management of infrastructure standards and requirements.
Relationships	The social capital possessed by the team in terms of relationships with key stakeholders (including senior management and key agency partners)

Figure 2 Components of the Modular Logic (Adapted from Agarwal & Sambamurthy, 2001)

Step 2: Identify the organizing options for each activity and capability.

Outlined below is an adapted version of Agarwal and Sambamurthy's "Components of Modular Logic." In this step, the goal is to link specific organizing options to each activity and capability. For instance, solutions delivery activities can be organized in a "centralized, decentralized, federal or outsourced" manner (Ibid). Figure 3 offers organizing options for each activity and capability.

Primary Activities/Organizing Options	
Solutions Delivery	• Centralized *(Operated from program office)* • Centralized, with additional Agency Manager roles to manage relationships and requirements of impacted agencies *(Operated from program office)* • Decentralized *(Dispersed among impacted agencies)* • Federal (De*livery groups reporting to both program office and agencies)* • Outsourced *(Contractor delivers with oversight by program office)*
Services Provisioning	• Centralized • Decentralized • Federal • Outsourced
Secondary Activities/Organizing Options *(Can be modified to include other support functions)*	
Financial Management	• Centralized *(perhaps centralized within managing partner and shared across multiple initiatives)* • Decentralized *(each initiative maintains its own resource)*
Contract Management	• Centralized *(perhaps centralized within managing partner and shared across multiple initiatives)* • Decentralized *(each initiative maintains its own resource)*
Capabilities/Organizing Options	
Knowledge (includes human capital)	• Centralized *(program office acquires and manages required know-how)* • Centralized around competencies *(could initiatives share certain resources?)* • Decentralized *(each impacted agency staffs project)* • Outsourced *(contractor provides know-how)*
Infrastructure	• Centralized • Distributed • Leased • ASP Hosted • Outsourced
Relationships	• N/A (Chain of command already identified)

Figure 3 Organizing Options (Adapted from Agarwal & Sambamurthy 2001)

Step 3: Identify the most appropriate organizing mode for each activity and capability.

Evaluating which organizing option best suits each initiative is perhaps more art than science. Agarwal and Sambamurthy's research suggests that organizational history and senior executive philosophy play a significant role (2001). However, in terms of the e-Government initiatives, there appear to be few precedents. Therefore, to assist in assessing the alternatives, Figure 4 outlines the key features, strengths and weaknesses of each option.

Option	Features	Strengths	Weaknesses
Centralized	Either owned and managed by a specific initiative or consolidated within a managing partner and shared between two or more initiatives. In terms of secondary activities, the managing partner owns the resource	• Economizes on IT skill needs • Perhaps promotes better management and oversight	• Requires additional staffing vs. sharing resources with impacted agencies • Ineffective development of agency-specific knowledge and expertise
Centralized, with additional Agency Manager roles to manage relationships and requirements of impacted agencies	Centralized, but includes dedicated Agency Managers role.	• Improves interaction with impacted agencies • Promotes focus on agency-specific needs	• Dedicated staff needed for Agency Manager role • Focus on agency-specific needs could create demands for customization – increasing project complexity
Federal	Multiple solutions delivery groups aligned with specific initiative requirements. Dual reporting to initiative and agencies.	• Balance between initiative innovation and agency coordination • Customization of IT to agency needs	• Complex coordination challenges due to dual reporting relationships • Potential for competing or conflicting interests
Decentralized	In terms of primary activities and knowledge, resources are allocated and managed by impacted agencies. In terms of secondary activities, initiatives own and manage the resource.	• Initiative does not need to hire dedicated staff • Potential for greater agency buy-in to initiative	• Limits initiative opportunities to leverage experience • Complex coordination • Potential for competing or conflicting interests
Outsourced	Contractor performs activity	• Leverage existing outside expertise • Flexibility	• Knowledge not retained • Perhaps adds complexity to support

Figure 4 Features, Strengths & Weaknesses of Organizing Options (Adapted from Agarwal and Sambamurthy 8/2001)

Step 4. Integrate the activities and capabilities into existing organizational architecture.

Overall governance is provided by both OMB and a managing partner (such as GSA). As expected, each initiative's program manager defines activities and capabilities. Either OMB or a specific managing partner could identify opportunities to share resources centrally between two or more initiatives. For instance, the initiatives currently sponsored by GSA are sharing a contract manager in order to standardize the approaches and potentially leverage buying power. Additional opportunities for achieving efficiency may be uncovered and should be considered.

Step 5. Improvise an organizational architecture.

Both OMB and managing partners serve valuable roles across the 23 initiatives. According to Agarwal and Sambamurthy, private sector CIOs "find that no single integration strategy alone might be appropriate to effectively manage all of their firm's IT [activities]" (2001, pg 6). For that reason, they suggest that improvising "supplemental architectures" adds flexibility and allows private firms to extend capabilities and manage all activities.

Along the same lines, OMB and the managing partners can improvise as related to the initiative's activities. For instance, it may be determined that one initiative requires an outsourced solution for an activity typically centralized by other initiatives. By allowing for such customization, the modular approach promotes flexibility, adaptability and innovation.

The Modular Approach's Fit with OMB

The modular approach, as described above, is ideal for the unique needs of OMB because it allows for customization and scalability. The ability to build unique models for each initiative, with varying value streams, organizing tactics and features, will allow each agency to maintain its primary focus while contributing to collaborative projects simultaneously.

Team Attributes

Studies of successful teams derive primarily from new product development, R&D, engineering and I/T environments. However, the concepts can be applied broadly.

Collaborative Purpose or Shared Vision

Shared vision is a critical element that binds together highly effective teams. Unfortunately, in hurried situations, insufficient time is spent on ensuring that all team members are driving in the same direction. Teams can feel pressure to be moving in some direction, with the belief that their work will ultimately be useful towards the end goal. As projects increase in their complexity and number of parties involved, the common understanding of the ultimate objective is of increasing importance.

Suggestions for program managers of the e-Government initiatives include drafting strong vision statements, keeping goals clear and developing achievable, stepped objectives.

Trust

Trust is a key component of successful collaborative teams. According to Fukuyama (1995), trust 'societies' are particularly beneficial during periods of innovation, technological change, and strategic change. The stronger the level of trust, the more flexible and adaptable a team becomes in its pursuit of an objective. Once this is recognized, the question becomes how to foster trust within a team. This is particularly relevant to the e-Government initiatives where individual team members selected from representative agencies may bring preconceived notions of others' objectives.

Research conducted by Jergeas, Herzog, and Beikhuizen (1997) found several aspects relevant to fostering a trusting partnership, with 'sharing' being the primary factor. Where open and honest communication is a common operating principle, team members are more likely to trust their colleagues. Other team attributes cited include an appreciation of individual and team roles, team pride, joint responsibility, and collaborative problem solving.

Trust issues extend beyond expecting group members to fulfill their commitments. Open, trusting environments foster vulnerability and questioning of assumptions. This atmosphere can reduce oversights and encourage beneficial risks and leaps of faith.

Size Issues

One common concern regarding team design is the optimal number of members to achieve the team's goal in an efficient and expeditious manner. Our research found several recommendations regarding maximum team size (ranging from 8-20). However, it was noted, "teams are getting larger and more geographically dispersed" (Gibbons and Brenowitz, 2001, pg 3). This has been a natural progression due to the increasing complexities of projects undertaken and an increase in the number of parties with stakes in the outcome.

One consultant suggested, "team size is contingent on the number of employees whose activities are independent and who are mutually accountable to other for results" (*Compensation and Benefits Review*,1996). The mutual accountability is a critical element of that relationship. Losing mutual accountability becomes a concern when team size exceeds 15 members (Ibid).

The bearing of these findings impacts e-Government initiatives projected to have thousands of parties involved in the development process. Teams should be structured to both have a core collaborative team responsible for the overall direction, and subteams mutually accountable for elements of the overarching goal. New collaborative IT software can assist in enabling status checks, consistency across teams, and continuing to pursue the same goal.

II. Team Management

Reporting

Although we have offered a process for designing a team's organization, a significant collaborative implication remains unresolved for the e-government initiatives. Specifically, the issues associated with reporting and appraisal add complexity to the mix. The projects are following a team design similar to that of matrix organizations, which originated during the mid-1950's. According to Dunn (2001, pg 2), matrix forms were outgrowths of companies "utilizing projects for work delivery, allowing them to retain functional groupings while meeting the needs of multiple projects".

For some projects, resources continue to be shared between the project and their respective agency. Individuals continued to be responsible for many of the same duties as before. Split duties complicate the already potentially contentious dual reporting structure to both a team leader and a functional manager. Indeed, this conflict between multiple lines of supervision is frequently identified as the primary disadvantage of matrix organizations. Kahn, et al. (Knight, 1976) cited the primary potential sources of stress as role conflict, role ambiguity, and role overload. Several questions are raised. How to minimize conflict? Who is responsible for the member's appraisal? What type of evaluation system is included? How does the team leader ensure that the shared resource has the time to fulfill team obligations?

The answers to these questions will vary by team, based upon capabilities and needs. Much research was conducted by Dunn (2001), regarding the typical roles performed by functional and team managers throughout matrixed organizations. The findings supported that the functional manager retained many of the responsibilities regarding the job environment. These included personnel development, evaluation and reward, and overall oversight. Other project-oriented responsibilities became the domain of project managers. These include interpersonal team skill development, scheduling, conflict resolution, team building, and administration. Tasks like leadership, planning, communication, budgeting, and motivation were performed by both the functional and project management.

Appraisal

Appraisal within the team environment brings unique challenges as well. How should employees be appraised regarding performance? What skills, behaviors or results are rewarded, and who decides the verdict? A number of appraisal methods are available, including: individual skills, behavioral competencies, or meeting team performance goals (Lake, 1996). Which are utilized will depend upon the success factors identified within the organization. Many firms have a tendency to evaluate more junior employees on their behavioral traits and skills. As employees are able to provide a greater impact upon the overall results through reaching higher positions, they are increasingly evaluated by the results achieved.

Evaluations can be performed by either the team (360-degree appraisal) or the manager. In some cases, managers continue to hold responsibility for the appraisal of subordinates. One advantage to this system is that they may have the broader context of the organization in mind while completing the evaluations. Team members may have had important contributions that did not directly impact others on the team. A disadvantage is that control lies in the hands of an individual, while the complete team may have a deeper understanding of member's daily interactions and behaviors.

360-degree appraisal systems emphasize the importance of the team. Criteria can also be tailored to place priority upon desired characteristics and behaviors. One firm reviewed team members several times a year on the following criteria:

- Commitment – Team member significantly and proactively contributes to achieving the team's mission and objectives
- Quality and Timeliness - Team member's deliverables are of high quality and completed on time.
- Teamwork – Team member's interactions with others are conducted professionally and in the spirit of teamwork, cooperation and support.
- Communication – Team member clearly and proactively communicates ideas, concerns, and recommendations.
- Accountability – Team member arrives at team meetings/activities prepared and actively participates in team discussions
- Diversity – Team member demonstrates that he/she values and respects the thoughts, concerns, inputs and responsibilities of others and recognizes that everyone has something to contribute" (Lake, 1996).

III. Team Processes

Two main issues must be addressed in order to improve team processes. The first issue is one of place, i.e. – where do processes take place. The second issue is one of sequence, the order in which tasks are scheduled to achieve project completion. Virtual teaming environments (enabled by software collaboration tools and IT infrastructure) can support process improvement, but should be properly considered as tools that enhance team processes as opposed to a new management paradigm.

The promise of electronic collaboration is that teams can work as geographically dispersed individuals or units. The attraction is that meetings can be replaced by real-time or near real-time information channels, thereby offering cost savings in reduced travel and greater efficiency. For example, collaboration tools extend the capability of existing project management software packages by adding communications, messaging, and other coordination features. Yet, it must be realized that certain processes require face-to-face meetings or collocation. The initiation of projects, for example, require the development of shared understanding and trust building through either temporary or permanent collocation. (Malhotra, 2001)

Teams are also impacted by the ability to develop new sequences of traditional work processes. Significant efficiencies can be obtained through the ability to convert serial processes to parallel processes to save time and potentially reduce labor costs. However, it is difficult to gain significant parallelism from creative or contentious processes, because solutions are often achieved in unpredictable ways. Ambiguous contexts, roles, or norms will necessitate collaborative processes that cannot necessarily be implemented by virtual teams. (Ibid.)

Consideration must therefore be given to the nature of the tasks as well as the stage of the project in evaluating the appropriateness of electronic collaboration. Work processes are guided by expectations and beliefs that are shaped by mutual understanding. "Unless the organizational culture and norms established and reinforced by senior management support openness, information exchange, and trust building, it is overly optimistic to expect transparency ….to emerge within teams." (Jassawalla and Sashittal, 2001, p.4) While the promises of collaboration software packages contribute to greater awareness by improving communication and knowledge management, it also creates the opportunity for information overload. Managers must be discerning in the application of such tools due to the current limitations to handle tacit information.

IV. Team Support

Resources:

Basic resources teams need include tools, appropriate meeting space, access to computing services and standard software, and other resources that make it possible for the team to work in a timely, proactive and effective fashion. Teams that have such resources readily available strongly outperform teams that do not. Lack of resources is among the factors demoralizing the team and preventing it from embracing self-management.

Some leaders are reluctant to hand over resources to struggling teams under the premise that "they haven't learned to manage them yet." A solution to this problem could be engaging the team(s) in a discussion of resources they really need to perform well. An agreement can be negotiated whereby the team(s) commit to tackling particular performance problems in exchange for additional resources. Such practices help teams see more clearly what they need to do and assure them that they would have basic resources necessary to solve their work problems. (Wageman, 1997)

Our survey of initiative leaders (aggregated results provided in Exhibit E – Survey Result Summary) demonstrates the breadth of IT resources considered to be important for improving electronic collaboration. Beyond the fact that the survey has a small sample size of 3), the survey criteria are open to interpretation, which undoubtedly contributes to the variability of the results. Project management was seen to be the most important function of a collaborative toolset, with ease of use being the key evaluative criterion. Microsoft Project integration was selected as a key attribute, presumably because the G.S.A. has standardized on this software package. Collaborative editing, and access/release control were seen to be the most desirable attributes of document management tools. These results suggest that there is a wide spectrum of potential needs to meet with new collaborative resources.

Collaborative Training:

Virtually every study on teams and collaboration cited training as a fundamental element in promoting highly effective collaboration. One study on new product development teams suggested that "collaborative behaviors are difficult to learn and seldom result from mere membership on teams" (Jassawalla and Sashittal, 1999).

Most studies promote formalized team-building activities. One commentator suggested an intensive organizing initial training session.

Research indicates that collaborative training peaks at 10% of the employee's time during project start-up and major change efforts, and continues at about 4% for the rest of the project (maintenance). (Joinson, 1999)

Collaborative training usually consists of two parts:

1. **Training in team tools** – team members learn to use a variety of tools, including problem soling techniques, statistical process control and flowcharting. After an initial overview, this training is best delivered in a just-in-time fashion, with employees learning about a specific tool just before they use it.

2. **Facilitation in team planning and group skills** – focus on the specific issues a team will face, helping the members create a charter, set ground rules and solidify other teamwork elements. The training also cover the skills needed to function as a group, such as meeting management, stages of group development and how to avoid "groupthink".

Collaborative training works best when all members of the team receive it at the same time. Many organizations do not realize this and "mix and match" their classroom attendance with people from different teams. This approach may make it easier to schedule the training, but it doesn't promote the spirit of a particular team. And it isn't the point of the training. (Chaudron, 1995)

I/T Tools

Web-Based Collaborative Tools and Knowledge Management

We will provide a detailed discussion of web-based collaborative tools in the second half of this paper. Research on virtual teams has found that knowledge sharing in virtual teams is facilitated by evenly distributing knowledge to all team members, communicating knowledge of both content and context, ensuring that informal knowledge-sharing opportunities are not suppressed, and allowing for decision processes to not become too explicit to be monitored by others (Malhotra, et al., 2001).

Conclusions & Recommendations

Successful collaboration depends on highly effective teams. In recognition of the extraordinary tasks facing the managing partners and program, we offer the following suggestions and considerations to aid initiative delivery.

For Program Managers:

- **Team Design:** Quickly identify as many primary and secondary activities and expected capabilities as possible. Organize within the categories identified in Figure 2 (page 10) and consider what organizing option offers the best fit. Certain activities and capabilities may be outsourced, while others are better centralized.

- **Team Attributes:** Organize a core team of no more than 15 members. Collectively agree upon a shared project vision and work to build a sense of collaborative purpose. Find opportunities to use teambuilding activities or training to foster trust and open communications. Identify and resolve potential issues early.

- **Team Management:** Clearly outline the team's reporting structure and appraisal processes. For some initiatives, resources will be shared between the project and an agency, and roles will require definition. Will the team manage itself? If so, 360-degree appraisals can assist in emphasizing the team's responsibilities.

- **Team Processes:** Determine where primary activities will occur and sequence the tasks clearly. Will the team be collocated or dispersed? If dispersed, additional challenges arise – how will collaboration, trust and shared purpose be achieved?

For Managing Partners:

- **Team Design:** Assess the expected activities and capabilities of each initiative. Identify activities and capabilities that could employ shared resources, like contract procurement. Serve as a central point for knowledge management – specifically, if one initiative finds a creative organizing option, share the idea with other initiatives.

- **Team Support:** Consider hiring a professional trainer early in the process to facilitate team development. Additionally, if a collaborative software program is deployed, engage an expert to serve as a shared resource. Just as you actively collect and share best practices among program managers, attempt to collect and share resources as well.

Web-Based Software Providing Organization Support

Overview

As indicated above, software can be used as a shared resource to support teams. In order to assist the office of Electronic Government with the implementation of various initiatives, all of which require varying levels of inter and intra agency collaboration, we have identified and analyzed several collaboration tools. These tools have been evaluated according to the unique complexities and scope of the various initiatives, as discussed above. Specifically, we used the following guidelines:

Minimum Requirements

1. Web based with no requirement of any software installation unique to the product.

2. Shared virtual workspaces with varying levels of availability.

3. Asynchronous discussion capability, such as threaded discussion boards, message boards or email.

4. Scheduling tool, such as a shared calendar or shared Gantt schedules.

Products that meet the above minimum requirements are listed below.

Product	**Company**
Teamcenter	Inovie
eRoom	eRoom
WebWorkZone	Sitescape
Quickplace	Lotus
CyberAlliances	Cyberalliances
Arcturus	Arcturus
Groove	Groove
Intraspect	Intraspect
Active Project	EBS

Figure 5 Companies & Products Evaluated

The look and feel varies widely across the products listed in Figure 6. All have functionality that supports and enhances the set of minimum features listed above. For the purposes of this evaluation, we have put a high value on project management and document management functionality while keeping a critical eye on each product's ease of use. These dimensions are valued based on instructions provided by e-Gov and comments from the Sanford and Burke interviews and surveys (Appendixes E and F).

The review of each product is dependent on the availability of product demonstrations. Each product website provides a list of functionality, requirements and suggested uses. Because the web-based collaboration software market is still in its infancy, different companies use non-standard terminology to describe similar functions. Therefore, many functionality lists are full of company-specific expressions. It is, therefore, difficult to make comparisons based on these website-provided lists , such that hands-on demonstrations are necessary to make meaningful distinctions between packages.

The quality of the demonstrations we were able to view also varied. With CyberAlliances, eRoom and Arcturus, we were able to log in and manipulate the product while speaking with a company representative (for CyberAlliances we spoke to CEO Deepak Kanungo; for eRoom we spoke to Sales Representative Jason Messina, and for Arcturus we spoke to CEO Matt Kern). WebWorkZone and Groove allow entry into sample web based work spaces. Teamcenter, Intraspect, Active Project uses a slide show method to show static screens and explanations of functionality. As part of the preparation for this project we used Quickplace. Each member of our team became a member, and we posted, shared and edited documents, used the calendar functionality as well as its discussion and instant messaging capability.

To facilitate a preliminary means of evaluation, we constructed a side-by-side comparison of each product against a compilation of all features provided by the products. This comparison, in Appendix D, illustrates the baseline functionality, common added functionality and functionality unique to each product. It is evident from this comparison that Teamcenter, CyberAlliances, eRoom and Active Project contain the most comprehensive set of tools.

As mentioned earlier, the language used to describe functionality is sometimes ambiguous and often inconsistent. While we will use some of the same terms as are found on the websites of the reviewed products, we have attempted to develop common definitions for these terms. Our terminology matches a majority of the language used for product marketing, but not in all cases. Terms used in this evaluation are defined in Exhibit A, and should not be confused with similar sounding or even identical terms used by the websites of the reviewed products but defined differently on those websites.

Product Evaluations

For each company we provide the company name, product evaluated, website, features, pros and cons, a quick summary and company contact information in Appendix B. The features for each product are listed and discussed in Appendix C. To facilitate comparison, we have summarized this information by rating each product on ease of use, document management functionality and project management. We rated these products relative to each other, not against an external standard. A total score, based on an evenly weighted sum of the dimensional scores is also calculated to determine the most complete offerings (for instances where the most complete package is warranted). Figure 6 provides a summary of our findings.

Product	**Company**	Ease of Use (1-10)	Document Mgmt (1-10)	Project Mgmt (1-10)	**Total**
Teamcenter	Inovie	8	9	9	**26**
eRoom	eRoom	8	7	7	**22**
WebWorkZone	Sitescape	9	2	5	**16**
Quickplace	Lotus	7	5	6	**18**
CyberAlliances	Cyberalliances	8	7	7	**22**
Arcturus	Arcturus	7	9	7	**23**
Groove	Groove	9	5	9	**23**
Intraspect	Intraspect	6	8	8	**22**
Active Project	EBS	6	7	8	**21**

Figure 6 Evaluation Summary

Support of Organizational Issues

As we indicated earlier, our goal is to provide the program managers with tools to design effective teams and offer managing partners recommendations for supporting multiple initiatives. We lay out and discussed four areas of concern; team design, team processes, team support and team management. We suggest using a web-based collaboration tool, such as those being discussed, to address these four components.

Team Design

The software can be used to facilitate the building and designing of teams. An example of this is searchable member profiling. This function enables the strengths, availability, experience and interests of team members to be profiled. Team builders can search this database to build their teams, and team members can search this database to find those that may be able to help them.

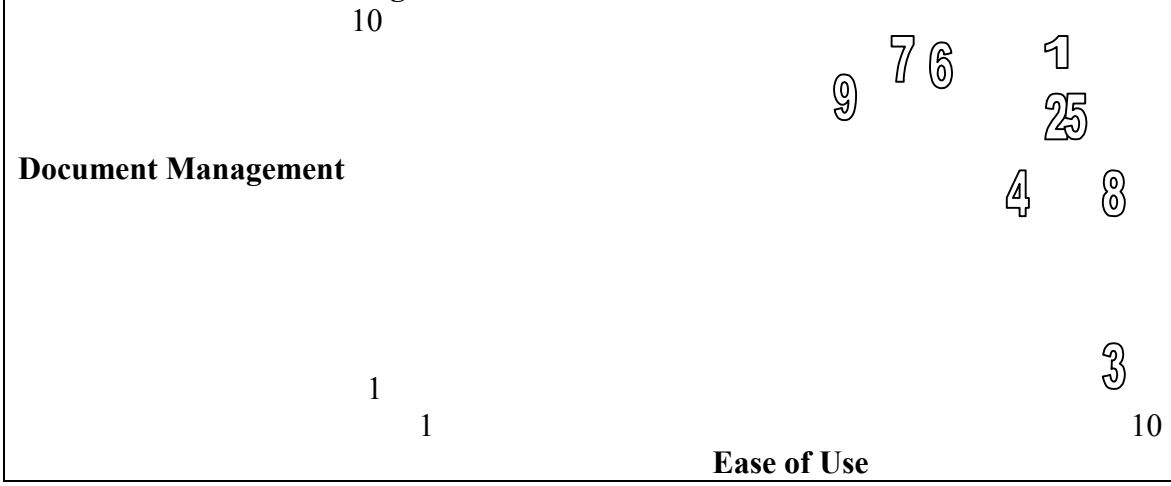
Team Processes

Choose a web-based collaboration tool that most accurately meets the needs of the designed team. From our interviews, we concluded that project management functionality, document management functionality and ease of use are important attributes. We constructed two-dimensional matrices to facilitate the evaluation of the products along these attributes. For example, Matrix 1 illustrates that Teamcenter provides the best blend of ease of use and document management, while WebWorkZone excels in ease of use, but does not provide the document management tools provided by others. For a team interested in ease of use, and does not require document management functionality, this Matrix would therefore help them to choose WebWorkZone as their best fit. However, a team interested in both document management and ease of use would want to choose TeamCenter.

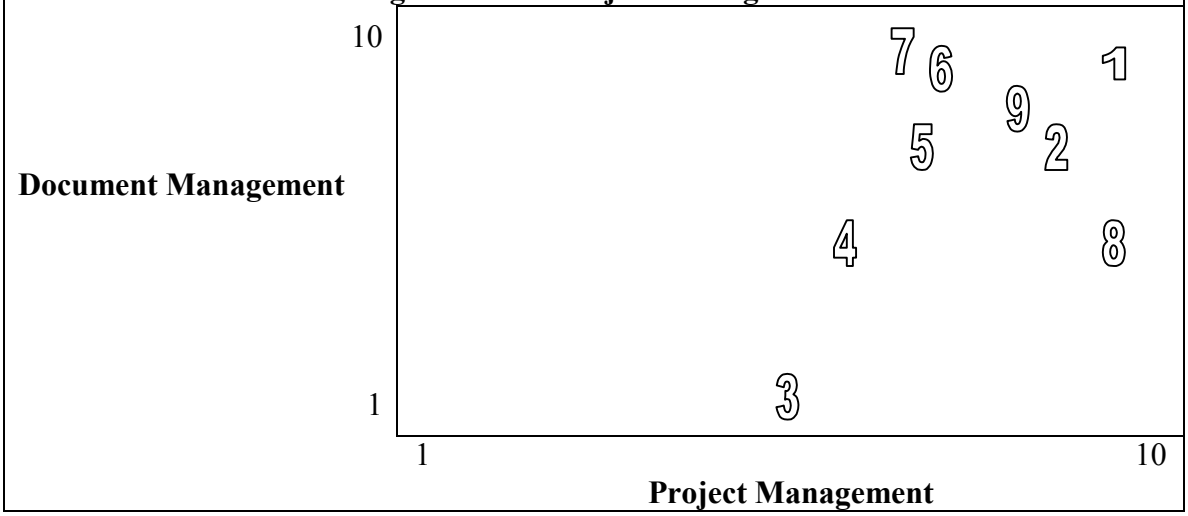
Product	Number
Teamcenter	1
eRoom	2
WebWorkZone	3
Quickplace	4
CyberAlliances	5
Arcturus	6
Groove	7
Intraspect	8
Active Project	9

Table 1. Numbers used For Matrices and Figures 7 and 8

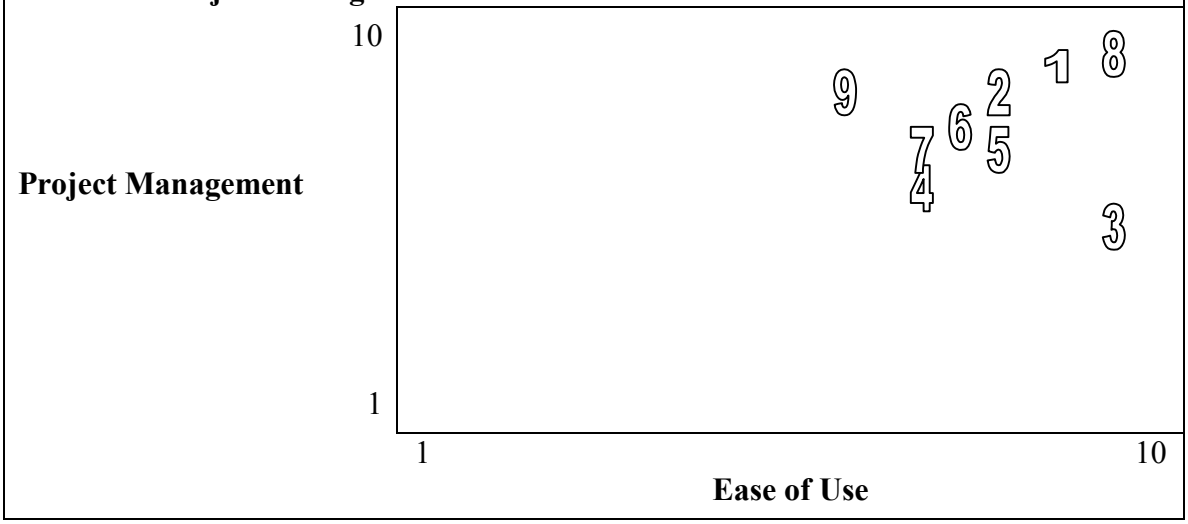
Matrix 1. Document Management and Ease of Use



Matrix 2. Document Management and Project Management



Matrix 3. Project Management and Ease of Use



Where evaluation of the above matrices results in several tools still under consideration, we recommend that the individual analysis for each tool be consulted (Appendix contains individual analyses). For example, eRoom and Teamcenter are both found in the upper right corner of all three matrices. Upon inspection of the specific analyses found in Appendix B and C, which provide a description of the tools, along with commentary on the functionality, it is evident that Teamcenter actually has more management tools. To further refine the evaluation of products along project management and document management functionality, Figures 7 and 8 are provided. These figures list the functionality that support the two dimensions and show which product offers each function.

Product	**5**	**1**	**9**	**2**	**8**	**6**	**4**	**3**	**7**
Online rating of partners	■								
Tracked communication			■						
Web conferencing			■						
Redline and text on Drawings			■			■			
Resource allocation evaluation		■							
Timecard Reporting		■							
Online polling	■			■					
Skill Sets & Skills Tracking	■			■					
Cost Management	■	■							
Management Reporting	■	■	■		■	■			
Executive summaries	■	■			■				
Task delegation	■	■	■			■	■		
Event Notification System	■	■		■	■		■		
Access control and security[2]	■	■	■	■	■	■	■		■
Web work space	■	■	■	■	■	■	■	■	■
Calendars[1]	■	■	■	■	■	■	■	■	■

Figure 7 Project Management Function Comparison

Product	**1**	**9**	**4**	**5**	**6**	**2**	**8**	**3**	**7**
Drag and drop file sharing	■		■						
Attach comments to documents		■							
Multiple app viewing tool		■	■						
Doc. change tracking (within)	■								
Search Engine	■		■	■	■	■	■		
Doc. change tracking (author, title, etc)	■	■	■	■	■	■			
Web repository	■	■	■	■	■	■	■	■	
Posting, sharing and editing of doc	■	■	■	■	■	■	■	■	■

Figure 8 Document Management Function Comparison

Team Support

Each tool should also be evaluated based on a comparison of the amount of support it provides to the team with the amount required by each team. During our interviews we were unable to develop comprehensive lists of the specific team needs, due primarily to information sensitivity concerns and the early stage of development of many teams. However, such lists should be constructed by each team leader or organizer, with the input from team members. We would suggest that the list be constructed by taking all of the functions listed in Appendix D, and checking off those that are beneficial, which are required and which are not helpful at all. This list, when compared side by side to Appendix D would allow the best match of support functions needed to support functions provided.

Team Management

The ability of the tools and the requirement of management to monitor the progress, evaluate the performance and measure costs in real time should be considered. Some tools provide comprehensive management features, while others do not even attempt to venture into this area. Please refer to Figure 9 for a side by side comparison of each product's management functions.

Function	1	5	2	9	4	6	8	3	7
Timecard Reporting									
Resource allocation evaluation									
Skill Sets & Skills Tracking									
Cost Management									
Management Reporting									
Executive summaries									
Task delegation									
Search Engine									
Event Notification System									
Access control and security									
Calendars									

Figure 9 Team Management Functions

Conclusions and Recommendations

We have taken nine industry-leading web-based collaboration tools and evaluated them using various methods against various dimensions. These methods included a quantitative evaluation, a qualitative evaluation and product offerings comparisons. In doing so, we hope to provide the Office of Electronic Government with tools with which they can determine which products are best suited for its use.

With the level of analysis provided above, and the obvious strengths and weaknesses of various products, it is tempting to draw conclusions that some products are better than others are. However, we would argue that each product might be ideal for certain teams, given different goals and objectives of those teams. With this caveat, we make recommendations based on the information provided during interviews and summarized in Exhibit E.

Ease of use is the most valued function, with a score of 38.3. This is followed by project management (36.7), communication (31.7) and document management (26.7). Given these responses, we suggest that Teamcenter is the most appropriate product, due to its ability to most completely meet those needs. Following Teamcenter is eRoom, Arcturus and CyberAlliances.

The products suggested above best meet the combined needs of the teams. However, more customized matches may be appropriate for specific teams, as discussed above. Therefore, depending on the amount of interaction that different teams have with each other, it may be feasible to allow each group to determine which tool fits its unique needs the best. If this is the case, we recommend using the comparison tools provided in this paper to determine the best product for each team.

Appendix A - Definitions of Terms

Access control and security: Security allows administrators and Workplace owners to easily specify access rights and capabilities on a user-by-user basis at both the overall system and individual Workplace levels.

Attach comments to documents: Comments typed and saved may be attached to documents saved in the web repository. It is unclear if the comments are actually in the document, but it seems as though they are not.

Calendars: Any sort of time management tool such as the classical calendar view, Gantt charts or milestone reporting that can be shared.

Chat/Instant Messaging/Online Presence Detection: Any type of real-time messaging tool, similar to AOL instant messenger, which allows text to appear on the screen of the sendee almost at the same time as it is sent by the sender. This tool also indicates when users are online and available to communicate.

Cost Management: Associate bill rates with resources or Skill Sets and provide managers with detailed and summary project cost views, including estimated and accrued costs. Both variable labor and fixed costs are supported.

Customizable Databases: Create unlimited "worksheet-like" database objects for tracking action items, project risks, contact lists, issues, and much more.

Drag and drop file sharing: A tool that allows documents to be moved from one file to another simply by mousing over the file, clicking down and holding the click while mousing over to another location.

Document change tracking (by author, title, etc): A filing system that facilitates the versioning of documents to that the evolution of the document is illustrated, along with who made changes to each version.

Document change tracking (within document): This tool allows the marking up of documents by designated members of a given workspace, and indicates the author of each change.

Event Notification System: Event-based email notifications, including events related to Documents, Collaborative Notebooks and Group Discussions, speed team communication.

Executive Summaries: Executives can get updates on the status of all teams and projects. Event-based notices can be set to warn users of emerging trouble spots and much more.

Extensibility (API): API provides ability to extend the tool into the broader enterprise environment.

LDAP enterprise directory support: Get seamless integration with corporate naming directories easing administrative tasks.

Management Reporting: Provide management-level reports based on data entered.

Multiple app viewing tool: In addition to initiating desktop viewers, such as Microsoft Word for *.doc extensions, this took provides the ability to launch and view the application file in the workspace.

Multi-threaded, multi-topic discussions: A workspace that facilitates asynchronous discussion through the posting of discussion topics and indented responses under each topic.

"My ____" portal pages: These pages allow the customizing of portal pages. Examples include personalized calendars, customized news and customized web repositories.

Online rating of partners: This feature enables users to post evaluations of other team members or partners with which the user worked. The ratings are available for all users to view.

Online polling: Facilitates quick surveys of team or project members to gauge consensus or resolve issues.

Posting, sharing and editing of documents: The ability to save files in a web repository so that other team members can view the documents, edit the documents and save them back to the repository under another name or version number.

Redline and text on Drawings: Within the workspace, markup and share thoughts on CAD drawings and other graphic documents.

Resource allocation evaluation: This feature compiles the work associated with team members and compares it to an assumed maximum work level. Thus, a team leader can view the workload of various team members to help decide if some members are being under or over worked.

Search Engine: Search technology to perform searches across all individual workspaces and entries, including most attached documents.

Simultaneous multi-use of sch, disc and notebooks: This feature enables various team members to access the same calendar, discussion board or notebook at the same time. This does not necessarily mean that they will see changes by other members as they are made – a refresh of the browser may be necessary.

Skill Sets & Skills Tracking: This allows managers to more easily search and check availability of resources with the needed skill sets to accomplish the job at hand.

Summary Page: Essentially a portal view into the workspace. It displays a summary of your favorite discussions with new activity counts, today's calendar entries and scheduled chats, and a list of who is online for Quick Messaging.

Task delegation: A team leader can sort through various team members, choose those to delegate a given task to (possibly given their listed skills or workload) and send a message to them.

Timecard Reporting: This full-featured timecard reporting system includes approvals, ability for users to directly add new tasks, default accounting codes, and much more.

Tracked Communication: The recording of who has read and sent a given form of communication, such as a notification or email.

Web conferencing: Any type of conferencing over the web enabling the simultaneous input from multiple locations.

Web repository: Space on a server allocated for documents and accessible to members.

Web work space: A virtual meeting room set up for a particular purpose, usually includes postings, updates, discussions and group members.

Appendix B – Software Evaluation

Company: Inovie Software
Product: Teamcenter
Website: http://www.inovie.com
Pros: Multi-framed layout helps ease of use. Side frame shows hierarchy, middle frame contains workspace. This is the most comprehensive web-only tool.
Cons: Price?
Summary:

Ease of Use (1-10):	8
Document Mgmt (1-10):	9
Project Mgmt (1-10):	9
Total:	**26**

Contact Info:

Inovie Software, Inc
11995 El Camino Real, Suite 200
San Diego, CA 92130
(858) 792-3900
(858) 481-7088
info@inovie.com

Company: eRoom Technology, Inc.
Product: eRoom
Website: http://eroom.com
Pros: Easy to use, critically acclaimed (received recognition from CIO Magazine, PC Magazine, NetMarketing, ComputerWorld, others), large customers provide stability.
Cons: Bare-minimum functionality of provided tools, add-ons possible through API, document management examples are not provided.
Summary:

Ease of Use (1-10):	8
Document Mgmt (1-10):	7
Project Mgmt (1-10):	7
Total:	**22**

Contact Info:

eRoom technologies, Inc
725 Concord Avenue
Cambridge, MA 02138
617-497-6300
617-497-5055
support@eroom.com

Company: Sitescape
Product: WebWorkZone
Website: http://www.sitescape.com
Pros: This product is designed for communication and time management.
Cons: Lacks document management tools.
Summary:

Ease of Use (1-10):	9
Document Mgmt (1-10):	2
Project Mgmt (1-10):	5
Total:	**16**

Contact Info:

SiteScape, Inc.
2030 Eastwood Road, Suite 6
Wilmington, NC 28403
(910) 256-5038
(910) 256-5074
http://www.sitescape.com/next/contact.html

Company: Cyberalliances
Product: Cyberalliances
Website: http://cyberalliances.com
Pros: Small company willing to commit to providing most appropriate solution for e-Gov.
Cons: Manual input needed for cost evaluation. Uncertain future prospects as a going concern due to lack of customers.
Summary:

Ease of Use (1-10):	8
Document Mgmt (1-10):	7
Project Mgmt (1-10):	7
Total:	**22**

Contact Info:

CyberAlliances Inc.
20800 Homestead Road, Suite 11H
Cupertino, CA 95014
408-777-8490
support@cyberalliances.com

Company: Arcturus
Product: Arcturus
Website: http://www.productization.com
Pros: Three frame layout helps navigation. With API, any additional tool can be integrated into middle window. Familiarity with government. Revolutionary document management system which claims to result in lower cost and easier retrieval than Documentum.
Cons: Layout, while functional and relatively easy to navigate, is not as welcoming or alluring as other products.
Summary:

Ease of Use (1-10):	7
Document Mgmt (1-10):	9
Project Mgmt (1-10):	7
Total:	**23**

Contact Info:

Productization & Commercialization Incorporated
2545 Hillsman Street
Falls Church Virginia, 22043
Voice: 703.204.2922
Fax: 703.204.1666

Company: Groove
Product: Groove
Website: http://www.groove.net
Pros: Neat product, customizable and easy to use.
Cons: Groove requires installation on computer (we included Groove in the comparison at the request of e-Gov)
Summary:

Ease of Use (1-10):	9
Document Mgmt (1-10):	5
Project Mgmt (1-10):	9
Total:	**23**

Contact Info:

Groove Networks, Inc.
100 Cummings Center, Suite 5350
Beverly, MA, 01915
(978) 720-2000
(978) 720-2001
info@groove.net

Company: IBM Lotus Software
Product: Quickplace
Website: www.lotus.com/home.nsf/welcome/quickplace
Pros: Simple, intuitive layout, does not spread itself too thin by attempting to do everything. Viewing tool is helpful for quick reviews.
Cons: Some functions are made more difficult than necessary, such as document sharing. Bare-minimum functionality makes for simple layout, but limits options.
Summary:

Ease of Use (1-10):	7
Document Mgmt (1-10):	5
Project Mgmt (1-10):	6
Total:	**18**

Contact Info:
IBM Lotus Software
One Rogers Street, Cambridge, MA 02142
(617) 577-8500

Company: Intraspect
Product: Intraspect
Website: http://intraspect.com
Pros: Built to work with customers and intra-organizational departments at the same time.
Cons: Demo is not interactive, and is confusing at times – not clear if the problem is with the tool of the demo.
Summary:

Ease of Use (1-10):	6
Document Mgmt (1-10):	8
Project Mgmt (1-10):	8
Total:	**22**

Contact Info:
Intraspect Software, Inc.
8000 Marina Blvd, Suite 800
Brisbane, CA 94005
(650) 246-5200
(650) 869-6000
sales@intraspect.com

Company: Engineered Business Solutions
Product: Active Project
Website: http://www.engbsolutions.com/
Pros: Assorted file viewers; drag-and-drop file uploading; intuitive project area design.
Cons: Software runs only on Windows
Summary:

Ease of Use (1-10):	6
Document Mgmt (1-10):	7
Project Mgmt (1-10):	8
Total:	**21**

Contact Info:

Engineered Business Solutions, Inc
3311 Richmond Ave., Suite 317
Houston TX 77098
(713) 522-3480
(713) 524-0871
contactus@engbsolutions.com

Appendix C – Feature Discussion of Each Product

Where the functionality differs from that defined in the Definition of Terms (Appendix A), a description of that difference is provided under "Comments."

Teamcenter	
Features:	**Comments**
Posting, sharing and editing of documents	Easy to navigate between multiple workspaces containing documents, also easy to post, uses native viewers.
Multi-threaded, multi-topic discussions	Intuitive navigation with two-framed view.
Calendars	Uses Gantt charts to assist with project management.
Web work space	Contained in middle frame.
Web repository	Standard functionality.
Simultaneous multi-use of sch, disc and notebooks	Standard functionality.
Chat/Instant Messaging/Online Presence Detection	Standard functionality.
Access control and security	Based on login ID and password – not role based. Project managers can customize accessibility for each project.
Event Notification System	Customizable through a wizard.
Search Engine	Standard functionality.
Task delegation	Provides list of team member's assignment status and current workload.
Executive summaries	Reports include workplace and individual timesheets, workplace tasking and budget reports.
Management Reporting	Tools include project status, issue tracking, milestone identification, and timesheets.
Document change tracking (by author, title, etc)	Well organized, shows which documents are "checked out" and by whom.
Document change tracking (within document)	Example not provided.
Resource allocation evaluation	Charts workload of each member by capacity and task.
Cost Management	Compares actual costs to expected, lists costs by activities, shows status of activities.
Extensibility (API) and customization	Standard functionality.
Timecard Reporting	Allows task identification, and status, plus time entry.
Drag and drop file sharing	Standard functionality.
Customizable databases	Can import/export to .csv compatible applications (like excel).
LDAP enterprise directory support	Standard functionality.

eRoom	
Features:	**Comments**
Posting, sharing and editing of documents	Indicated, but no example found in demo, uses native viewers.
Multi-threaded, multi-topic discussions	Bulletin board allows hyperlinks and document postings.
Calendars	Classical calendar view. Clickable items that lead to more detailed view. Documents can be posted to detailed view area.
Web work space	Easy and straight-forward navigation.
Web repository	Standard functionality.
Simultaneous multi-use of sch, disc and notebooks	Standard functionality.
Access control and security	Based on list of names, not defined roles.
Event Notification System	Option of sending notification of document changes.
Search Engine	Search by text, author or date.
Skill Sets & Skills Tracking	Capability indicated but not found on demo
Document Change Tracking (by author, title, etc.)	No example provided
Extensibility (API) and customization	Example provided is integration with Outlook
Customizable databases	Can be used to perform skill searches for team building
LDAP enterprise support	Standard functionality.
Online polling	Allows customization of questions and viewing accessibility of results and who voted for what.

WebWorkZone	
Features:	**Comments**
Posting, sharing and editing of documents	Unclear of how to post or retrieve documents, uses native viewers.
Multi-threaded, multi-topic discussions	Discussions are well organized by multiple attributes.
Calendars	Provides option to view by day, week, month or year. Drill down provides small amount of additional information.
Web work space	Very little functionality.
Web repository	Unclear of how to post documents.
Simultaneous multi-use of sch, disc and notebooks	Standard functionality.
Chat/Instant Messaging/Online Presence Detection	Standard functionality.
"My ____" portal pages	Includes calendar, contact list and news.

CyberAlliances	
Features:	**Comments**
Posting, sharing and editing of documents	Easy interface with desktop for uploads and downloads, uses native viewers.
Multi-threaded, multi-topic discussions	Navigation would be easier with frames.
Calendars	Viewable by day, week or month, exportable as .CSV file.
Web work space	Simple navigation, intuitive layout.
Web repository	Standard functionality.
Simultaneous multi-use of sch, disc and notebooks	Standard functionality.
Access control and security	Based on login name, can be customized by project managers for each workspace.
Event Notification System	Standard functionality.
Search Engine	Searches for team members using profiles, does not search for documents.
Task delegation	Standard functionality.
Executive summaries	Reports performance based on cost metrics and time.
Management Reporting	Same tools as used for executive summary.
Document change tracking (by author, title, etc)	Standard functionality.
"My ____" portal pages	Customizes calendars, profile and events.
Cost Management	Compares actual costs to expected, shows variance.
Skill Sets & Skills Tracking	Standard functionality.
Online polling	Standard functionality.
Extensibility (API) and customization	Standard functionality.
Online rating of partners	Controversial, viewable by everyone.

Arcturus	
Features:	**Comments**
Posting, sharing and editing of documents	Standard functionality, uses native viewers.
Multi-threaded, multi-topic discussions	Standard functionality.
Calendars	Matt indicated that this function will be running soon.
Web work space	Customizable and relatively easy to use.
Web repository	Unique server sharing architecture, developed by former government worker fed up with Documentum architecture.
Access control and security	Role based instead of list based – theoretically improves scalability.
Search Engine	Standard functionality.
Task delegation	Standard functionality.
Management Reporting	Not standard for product, needs to be integrated.
Document change tracking (by author, title, etc)	Standard functionality.
Extensibility (API) and customization	Standard functionality, with third frame ready to use for any integrated tools.
Redline and text on Drawings	Uses native viewers.

Groove	
Features:	**Comments**
Posting, sharing and editing of documents	Standard functionality, uses native viewers.
Multi-threaded, multi-topic discussions	Standard functionality.
Calendars	Standard functionality.
Access control and security	Standard functionality.
Chat/Instant Messaging/Online Presence Detection	Standard functionality.
Simultaneous multi-use of sch, disc and notebooks	Standard functionality.
Web work space	Standard functionality.

Quickplace	
Features:	**Comments**
Posting, sharing and editing of documents	Posting and editing requires more steps than other tools.
Multi-threaded, multi-topic discussions	Standard functionality.
Calendars	Views include 1 and 2 day, 1 and 2 week and month. Also has drill down feature.
Web work space	Standard functionality.
Web repository	Standard functionality.
Simultaneous multi-use of sch, disc and notebooks	Shares calendars and discussions can be accessed at the same time.
Chat/Instant Messaging/Online Presence Detection	Standard functionality.
Access control and security	Name based, not role based.
Event Notification System	Customizable by author of change or event.
Search Engine	Standard functionality
Task delegation	Standard functionality
Document change tracking (by author, title, etc)	Standard functionality
Drag and drop file sharing	Standard functionality

Intraspect	
Features:	**Comments**
Posting, sharing and editing of documents	Allows use of browser or email to folder (which has an email address) as an attachment, uses native viewers.
Multi-threaded, multi-topic discussions	Standard functionality.
Calendars	Indicated but not shown in demo.
Web work space	Fairly comprehensive and intuitive.
Web repository	Standard functionality.
Access control and security	Based on login name, can be customized by project managers for each workspace.
Event Notification System	Can be customized to send
Search Engine	Standard functionality.
Executive summaries	Indicated but not shown in demo.
Management Reporting	Indicated but not shown in demo.
Extensibility (API) and customization	Standard functionality.

Active Project	
Features:	**Comments**
Posting, sharing and editing of documents	Standard functionality
Multi-threaded, multi-topic discussions	Standard functionality
Calendars	Indicated but served as a framework for sharing Microsoft Project schedules
Web work space	Set up simply
Web repository	Standard functionality
Simultaneous multi-use of sch, disc and notebooks	Standard functionality
Access control and security	Downloaded browser tools plug-in at the first visiting
Task delegation	Simply and speedy
Management Reporting	Standard functionality
Document change tracking (by author, title, etc)	Standard functionality
Redline and text on Drawings	Enabled to view various types of CAD files
Web conferencing	Standard functionality
Attach comments to documents	Standard functionality
Tracked communication	Tracked action items directly within the project.
Multiple app viewing tool	Standard functionality

Exhibit D – Functional Comparison

Functions										
Drag and drop file sharing										
Timecard Reporting										
Resource allocation evaluation										
Doc. change tracking (within document)										
Online rating of partners										
Multiple app viewing tool										
Tracked communication										
Attach comments to documents										
Redline and text on Drawings										
LDAP enterprise directory support										
Customizable databases										
Extensibility (API) and customization										
Online polling										
Skill Sets & Skills Tracking										
Cost Management										
"My ____ " portal pages										
Doc. change tracking (by author, title, etc)										
Management Reporting										
Executive summaries										
Task delegation										
Search Engine										
Event Notification System										
Access control and security										
Chat/IM/Online Presence Detection										
Sim. multi-use of sch, disc and notebooks										
Web repository										
Web work space										
Calendars										
Multi-threaded, multi-topic discussions										
Posting, sharing and editing of documents										
Product	Teamcenter	Cyber-All.	eRoom	Active Project	Quickplace	Arcturus	Intraspect	WWZ	Groove	Team Space
Company	Inovie	Cyber-All.	eRoom	EBS	Lotus	Arcturus	Intraspect	Sitescape	Groove	Flypaper

Exhibit E – Survey Results

Section I: Ranking Evaluative Criteria

Criteria	Average Points Allocated	Standard Deviation
Ease of Use	38.3	27.5
Price (server, client, development)	6.5	2.1
24x7 Availability	6.5	2.1
Web-enablement	16.7	5.8
Scalability (number of simultaneous users)	6.5	3.5
Customizability	6.0	2.8
Vendor has existing Federal customers	5.0	4.2
Vendor provides development & consulting services	14.7	5.5
Vendor and product stability	15.0	7.1
Other		
Other		

Section II: Rating Functional Importance

Function	Average Points Allocated	Standard Deviation
Document Management	26.7	2.9
Project Management	36.7	11.5
Communications	31.7	7.6
Extensibility	5.0	8.7
Other		
Other		

Section III: Rating Specific Functional Importance

Function	Average Points Allocated	Standard Deviation
Document Management		
Archiving	11.7	2.9
Version Control	11.7	2.9
Access/Release Control	20.0	17.3
Collaborative Editing	28.3	7.6
Document-level Security	8.3	2.9
Document Compatibility (Word Perfect, MS Word etc.)	16.7	10.4
Other: "Work Flow Management"	3.3	5.8
Project Management		
Project Status Overview	13.3	18.9
Individual Status Updates	5.0	5.0
Gantt Charts	6.7	7.6
Microsoft Project Integration	23.3	17.6
Project Component Level Health Status & Milestones	15.0	10.0
Task Assignments	16.7	15.3
Skill Tracking	2.5	3.5
Approval Control	2.5	3.5
Other: "Earned Value Assessments"	12.5	17.7
Other: "Funds Tracking"	8.3	14.4
Communications		
E-mail	26.7	7.6
Instant Messaging	16.7	14.4
VoIP (Voice over Internet Protocol)	1.7	2.9
Threaded Discussions	23.3	7.6
Whiteboard	25.0	5.0
Other	6.7	11.5
Extensibility		
XML Capability	30.0	17.3
APIs (Application Programming Interfaces)	30.0	17.3
LDAP (Lightweight Directory Access Protocol)	13.3	11.5
OS Compatibility	13.3	11.5
Network Architecture Requirements (e.g.. JAVA enablement)	13.3	11.5
Other	0	0

Exhibit E – Survey Results Sorted by Rank

Section I: Ranking Evaluative Criteria

Criteria	Average Points Allocated	Standard Deviation
Ease of Use	38.3	27.5
Web-enablement	16.7	5.8
Vendor and product stability	15.0	7.1
Vendor provides development & consulting services	14.7	5.5
Scalability (number of simultaneous users)	6.5	3.5
Price (server, client, development)	6.5	2.1
24x7 Availability	6.5	2.1
Customizability	6.0	2.8
Vendor has existing Federal customers	5.0	4.2
Other		
Other		

Section II: Rating Functional Importance

Function	Average Points Allocated	Standard Deviation
Project Management	36.7	11.5
Communications	31.7	7.6
Document Management	26.7	2.9
Extensibility	5.0	8.7
Other		
Other		

Section III:	Rating Specific Functional Importance		
	Function	**Average Points Allocated**	**Standard Deviation**
Document Management			
	Collaborative Editing	28.3	7.6
	Access/Release Control	20.0	17.3
	Document Compatibility (Word Perfect, MS Word etc.)	16.7	10.4
	Archiving	11.7	2.9
	Version Control	11.7	2.9
	Document-level Security	8.3	2.9
	Other: "Work Flow Management"	3.3	5.8
Project Management			
	Microsoft Project Integration	23.3	17.6
	Task Assignments	16.7	15.3
	Project Component Level Health Status & Milestones	15.0	10.0
	Project Status Overview	13.3	18.9
	Other: "Earned Value Assessments"	12.5	17.7
	Other: "Funds Tracking"	8.3	14.4
	Gantt Charts	6.7	7.6
	Individual Status Updates	5.0	5.0
	Skill Tracking	2.5	3.5
	Approval Control	2.5	3.5
Communications			
	E-mail	26.7	7.6
	Whiteboard	25.0	5.0
	Threaded Discussions	23.3	7.6
	Instant Messaging	16.7	14.4
	Other	6.7	11.5
	VoIP (Voice over Internet Protocol)	1.7	2.9
Extensibility			
	XML Capability	30.0	17.3
	APIs (Application Programming Interfaces)	30.0	17.3
	LDAP (Lightweight Directory Access Protocol)	13.3	11.5
	OS Compatibility	13.3	11.5
	Network Architecture Requirements (e.g.. JAVA enablement)	13.3	11.5
	Other	0	0

Appendix F – Interviews

Source: **General Services Administration, Office of Governmentwide Policy**
Contact: **Timothy Burke, Director of Travel Management Policy**
Date: **November 21, 2001.** Interviewed by David Evans and Je Ryong Oh

Category: Business Practice for e-Travel Initiative

Prior and Current Practices

Last year, the federal government spent $9.6B on travel (including military). By law, the federal government is legally required to use travel agents to book flights, hotel stays, rental cars, and similar services. Private sector rules differ from government practice regarding travel (including entitlement restrictions, and City-Pair contracts).

The federal government has no travel data center (TDC), a central data warehouse. Instead, it uses multiple legacy computer systems that cannot provide proper account auditing and consolidation.

The eTravel Initiative was preceded by FedTrip, a pilot project involved MOUs for some agencies to do travel bookings via the world wide web, costing $13 on average instead of $37 per transaction. The Quicksilver project surveyed 100 agencies to generate 172 project candidates for collaborative e-Government projects. From this list, the CIO Council e-Government Initiatives were chosen for:

- Achievability
- Conformance with White House agenda
- Potential to serve government constituencies.

Role of GSA in eTravel Initiative

The role that the GSA performs in the eTravel initiative is strategic in nature - to create the program management office. Program establishment will involve determining staffing and resource requirements, project management, and introduction of common standards and performance metrics. Furthermore, the GSA will need to take a leadership role in change management with regard to:

- Adoption of best practices
- Integration of travel with HR function
- Meeting the requirements of the Government Paperwork Elimination Act (GPEA).

The eTravel Initiative

The focus of the Initiative is on cost management and program management, with a view to manage travel as a business rather than an HR function. There is perceived to be a 5-year window of opportunity to change best practices, by establishing a rules-based system that meets e-Government requirements. A potential savings of 10-20% of travel costs are expected annually in the few years of the program. Three primary objectives given for the eTravel initiative are:

- Consolidate business unit expenses
- Improve auditing and budget control
- Augment accessibility and personalization for federal employees.

There is the opportunity to provide an "end-to-end web enabled travel portal" supported by a back end bookings engine. Such a portal will enable:

- Transaction data collection
- Consolidation of accounts
- Ease of travel request approval
- Ease of reconciliation
- Performance-based budgeting and program assessment
- Automatic tracking/loading of expense report info.

Because commercial practice in this area is state-of-the-art and readily transferable, a pilot program is scheduled to be running and generating results in six months. Initial cost savings should provide an indication of long term savings. Current projections show cost savings of up to $9B over 9 years are possible through deployment of such a system (based on potential cost avoidance of $30 to $50 per booking over 15 million bookings per year).

Management Challenges

While there are substantial improvements possible in servicing federal travel needs, there are concomitant challenges in making the necessary changes. Chief among these challenges are the need to:

Leverage staffing resources using knowledge management techniques

Centralize information and access and coordinate communication to improve management of bureaucratic processes

Ensure data security as use of collaboration tools are extended to industry partners

Anticipate and accommodate complex political implications as travel industry suppliers face changing business opportunities.

Source: **General Services Administration, Office of Governmentwide Policy**
Contact: **Becky Rhodes, Deputy Associate Administrator**
Date: **November 14, 2001.** Interviewed by Jeff Biedell

Category: Business Practice for e-Travel Initiative

Prior and Current Practices

All agencies are currently at different stages of moving towards automation of their travel procedures. Legacy systems offer varying levels of capability, including HR systems. The GSA is currently undergoing an effort to centralize e-travel for the Federal government.

An interagency committee currently meets quarterly to discuss travel efforts. Close to 100 agencies, including the small agency council, are represented by over 100 individuals. Subsets of the committee, including State and DoD meet monthly.

Last year, the federal government spent over $9B on travel. Government practices regarding travel, including entitlement restrictions, and reimbursement differ from the public sector.

This project was initially assigned to OPM, with GSA assigned as a key partner. On November 13, the effort was officially assigned to GSA for development.

The eTravel Initiative

The eTravel initiative is designed to consolidate and centralize the development of eTravel enabling platforms. Travel agents have typically serviced the government at no fee, relying on commissions from industry. As these commissions have decreased, fee-based master contracts are becoming more typical. It is in the interests of the government to maximize their leverage through pooling travel services together into a single face.

The first step for the e-Travel initiative to accomplish was to identify the best features already developed by existing agency solutions. This step has been completed, and the respective agencies are now amongst the six partner agencies working with the GSA.

Features can be broken down into five stovepipes, each of which can be separately developed, but should work together within a federal travel portal. These stovepipes are planning, authorization, reservation, claims, and vendor reconciliation.

The Dept. of Transportation built the first search engine for government travel, FedTrip. This engine was tailored to the government needs including hotel per diems and entitlement regulations. Fed Trip and booking agency fees were paid for by industry; there were no costs tied to the government's usage. Eight agencies signed up to utilize Fed Trip, and this engine will serve as the primary platform for GSA eTravel development.

Agency Partners

Other agency partners beyond the GSA include DOT, VA, DOI, HUD, and Dept. of Treasury. One representative from each agency will be relocated to the GSA to work exsclusinvely on this project.

Management Challenges

There are several challenges currently facing the eTravel initiative:

- Need buy-in from interagency committee
- Need buy-in from Industry, potential partners include Sabre, Apollo, or Calico (Cendant). Ideally, this development of the project should be funded by industry.
- Need MOU from agencies for expectations and funding
- Tight timeline – 6 months for initial version up, with everything expected online

Source: **General Services Administration, Office of the CIO**
Contact: **Lewis Sanford, Chief Architect**
Date: **November 21, 2001.** Interviewed by David Evans and Je Ryong Oh

Category: Overview of e-Gov Initiatives

Implementation of Initiatives

There are approximately 23 Initiatives, ranging from $70M to $1.5B projects, with a politically defined timelines of 18 to 24 months to implement. The potential scale of several of these projects, in terms of users, rivals some of the largest private enterprise IT implementations.

Scale issues would normally take much longer to address, and begin with pilot test cases to emulate use by 50-odd users. Currently, GSA has no reference points in terms of staff expertise (with greater than 6 months of collaborative e-Government experience), prior project costs, or well-studied cost estimates. Initial case projections are therefore rough estimates for time and funding required.

Project Management

An early priority is to establish commonality of management practices for the Initiatives. This began with a common methodology for preparing the Initiative business cases (300B). Despite using this approach, the business cases appear to lack uniform consistency due to the very limited time allowed for preparation. Ironically, the process initiating collaboration within and across agencies allowed insufficient time for such collaboration. Nevertheless, it is believed that the perceived urgency is helping to move the process forward, with attention paid to the top 80% of issues. 300B drafts have been submitted to OMB.

While GSA is perceived to be a leading agency with respect to software adoption, application complexity is a significant barrier to common use of new software tools. Currently, GSA has standardized on Microsoft Project for project management, and has instituted use of Lotus QuickPlace as a collaborative environment. QuickPlace adoption appears to be ramping more slowly than desired, and has required encouragement of program leads to motivate teams to learn and use the application.

Discussion of Governance

The parties involved in developing, funding, implementing, and benefiting from the Initiatives can be grouped into three main types of participants: stakeholders, partners, and interested parties.

Stakeholders have some sort of risk at stake in the ventures, including:

- The Administration – with political leadership at stake;
- The Congress – with ultimate funding authority and political stakes;
- The Office of Management and Budget – with management oversight authority at stake;
- The GSA – with e-Government oversight at stake.

Partners are federal agencies that have budgetary impacts due to providing services or receiving services impacted by e-Government changes:

- Agencies assigned leadership responsibilities for one or more Initiatives;
- Agencies at large partnering with lead agencies;
- Dependent agencies who receive some provision of service or benefit from a lead agency (e.g., GIS or PKI)
- Education
- Expertise provision
- Marketing

Interested parties are potential users of e-Government services:

- Agencies who may use e-Gov services;
- State and local governments;
- Industry
- Businesses
- Contractors/Suppliers;
- Citizens.

Involvement in e-Government projects is largely driven by the perceived risks and benefits for the participant. At present, participation in the strategic governance has involved stakeholders and partners. Stakeholders currently view the potential opportunities of e-Government to outweigh the political risks. Partners are in the midst of determining the potential to gain or lose power over cost centers that they control. For example, Integrated Acquisition is GSA's "bread and butter", a program that the agency would like to maintain a leadership role in managing while implementing a collaborative Initiative. Interested parties hold the potential to significantly complicate the dynamics of collaborative governance by raising the risks, primarily, for stakeholders through formal or informal lobbying efforts.

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