
Avanade Point of View

Digital Collaboration

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Introduction

The purpose of this paper is to provide a point of view on digital collaboration. The intended audience is business and technology leaders with an interest in collaboration and enterprise computing. We present a business rationale and scenario for digital collaboration followed by a view of the IT services needed to enable it.

Executive Summary

With the rise of the global enterprise, Avanade believes that collaboration is an organizational capability that will become increasingly vital to business success and, further, that “**digital collaboration**”—the use of technologies to enable efficient and valuable connections among people and information—represents the area of IT with the greatest potential for improving business performance in the next five years.

While the domain is making progress, there is still substantial room for improvement in vendors’ offerings and enterprise adoption of digital collaboration.

Specifically, Avanade’s vision for digital collaboration in the enterprise is built around three areas where we see the most opportunity to create efficiency and productivity breakthroughs in how people work with information and with each other across a global enterprise:

First, the “tagging” of people, content and physical assets with context information (semantic keywords, presence, location, business processes et cetera) as a mechanism to automate the discovery and usage of information and expertise.

Second, enabling and fostering the development of user-driven content and communities to maximize employee contributions and connection to the organization. Transforming ideas in people’s heads and laptops into broadly used organizational assets and harnessing the power of communities as proven by the Internet.

Third, connecting the world of the knowledge worker with the operational view of the enterprise and with relevant external information—i.e., integrating familiar, easy-to-use spreadsheets, email, and virtual workspaces with information from corporate systems like ERP/CRM and third-party services—empowering employees with data and information that is critical to decision making but typically not easily accessed or used in enterprises today.

In order to realize the full potential, Avanade believes that IT departments will need to provide some new service offerings and take a holistic and proactive view on the enterprise architectures and tools required for digital collaboration.

Last, while this paper is technology focused, we recognize that the organizational metrics, incentives and culture will be the overarching success factor in any enterprise-wide collaboration initiative. We assume business sponsorship and employee buy-in as a pre-requisite for digital collaboration.

Collaboration enables economic and business success

At a macroeconomic level, information is the vital asset in increasingly service-based economies, and collaboration is the engine that generates value from this asset.

Collaboration also is fundamental to maximize the opportunity created by globalization through access to new markets and the potential to optimize workforces, supply chains and distribution channels.

At a microeconomic level, in today's ultra-competitive business environment, enterprises need to achieve and sustain a best-of-breed position in order to survive and thrive. The specific path to becoming best-of-breed will vary by industry sector and the specific circumstances of individual enterprises. However, Avanade believes there are several factors that are fundamental to achieving a best-of-breed position and which are enabled and improved by collaboration:

Innovation: New and improved products and processes increase organic growth and operating leverage. Collaboration among employees (and third-parties) generates ideas and reduces the cycle time for innovation.

Customer Relationships: Collaboration with customers to create truly customer-driven products and services increases sales and customer loyalty.

Supplier, Channel Partner Relationships: Synchronization and quality control of suppliers and channel partners to manage and optimize the customer experience end-to-end.

Stakeholder Relationships: Richer interactions with the increasing number of external stakeholders to whom an organization is accountable (investors, regulators, local communities et cetera).

Employee Empowerment: Organizations need to attract high-skilled employees in an environment where they will be in short supply for the considerable future. A workplace that allows employees to participate in dynamic project teams, active communities of interest and an environment of continuous learning is a tangible differentiator for an employer.

Operations Efficacy: Speed and quality of executing the core business processes of the organization.

Avanade believes that information technology is essential to enabling enterprises to build a collaborative environment and realize these benefits. Specifically, **digital collaboration**—the use of technologies to allow efficient and valuable connections among people and information—is critical to becoming an innovative company, to establishing high-value relationships with customers, partners, suppliers, and stakeholders; to attracting and retaining a highly skilled workforce; and to achieving high-performance operations. In short, Avanade believes digital collaboration represents the area of IT with the greatest potential for business impact in the next five years.

We do not attempt to provide a broad quantitative justification or ROI for digital collaboration in this paper. This is because the proposition will vary dramatically across organizations based on the specific processes impacted by digital collaboration, the prevailing cost structures and the approach to quantifying benefits. There are several valid computations available for measuring improvements in productivity and other management metrics that can be applied in building specific business cases. However, in our experience, their credibility and ultimate value as generalized decision making tools is tenuous at best. Instead, Avanade believes that individual enterprises should consider the rationale and priorities for digital collaboration within the context of their corporate strategy and with a focus on improving the priority processes. In our experience, the most immediate business benefits lie in IP-based unified communications solutions and the dynamic provisioning and support of virtual teams.

In addition, as noted above, we recognize that organizational metrics, incentives and culture will be the overarching success factor in any enterprise wide collaboration initiative. We assume business sponsorship and employee buy-in as a pre-requisite for digital collaboration.

The remainder of this paper looks at the current landscape and a vision for digital collaboration.

Digital Collaboration: The current landscape

Several collaboration technologies have emerged to address the growing demand for tools that help knowledge workers perform tasks and transactions faster and more effectively, but most are limited in some way.

As one might expect, ease of use and familiarity have proven key factors in the success of many of these tools. Email, text and instant messaging have become communication mainstays primarily due to their accessibility and ease of use. Although not yet pervasive, implementations of unified messaging and, more broadly, unified communications are starting to take hold to address the challenges associated with the proliferation and discontinuity between the repositories, applications and devices used to support communications. IP-based unified communications also provide immediate

tangible business benefits through improvement in communications costs and productivity.

The use of virtual workspaces to share documents, discussions and calendars with colleagues takes collaboration one step beyond messaging and conference calls and is becoming increasingly popular with project and department teams. These workspaces can be hosted inside the organization's firewall using its IT infrastructure or can be provisioned through a third-party service on the Internet. Virtual workspaces provide a good foundation for collaboration, especially when well integrated with common IT infrastructure services like identity management, authorization, messaging, or search. However, the typical workspace today does not allow for easy integration of information contained within related workspaces with the production data of the organization that resides in back office systems like SAP and custom applications and databases.

Similarly, virtual conferencing applications and services attempt to improve the experience of remote meetings. They allow for real-time audio and video sessions and can synchronize the viewing and annotation of documents. In addition to meetings, these solutions are particularly popular for virtual training and corporate communications. These solutions are a step-up from voice-only conference calls in terms of ease of use and potential to reduce travel costs but are still too often a quirky experience for end users. It is not uncommon to require separate connections for voice and data, and the effectiveness of the medium starts breaking down with an increasing number of users, meeting artifacts and network bandwidth limitations.

Search has dramatically improved personal productivity in recent years through faster and targeted navigation of the Internet, enabling an advertisement-driven business model that further perpetuates the usage and value of search. Desktop search tools are very effective at finding relevant content on individual users' computers, cutting across the applications and formats that house that information. Enterprises are exploring ways to apply the same productivity benefit of search to information stored in corporate repositories but have not encountered the same level of success thus far, partly because a lot of valuable content (or at least the latest version of that content) continues to be stored on individual user machines as opposed to corporate servers. Controlling access to sensitive information is a big area of concern and most enterprises do not yet have sophisticated authorization capabilities that control access to content items and specific operations on those content items. Last, a lot of the information in corporate back offices requires launching and exploring a business application in order to put the results of a search into the right context and gain value from them.

A new set of collaborative concepts and technologies have been driving spectacular growth in blogs, social networking and user-generated content sites on the Internet (Myspace.com[®], YouTube[™], Wikipedia among others). Some of the tools and thinking from these sites are very relevant to digital collaboration in the enterprise, not only as technologies but as fundamental ways to increase individual contributions and maximize the value derived from communities of interest.

Blogs and wikis are tools that make it easy for people to collaborate by creating, sharing and posting ideas and information to a website. Wikis allow a user community to contribute and edit content in real time with the ultimate goal of increasing the value of the content by harnessing the collective knowledge of the community through continuous refinement and updates. Blogs are typically content and diaries from individual authors. The content in blogs and wikis can be organized and linked to related content and typically require minimal support by IT departments when used in corporate environments.

Web feed technologies like RSS (Really Simple Syndication) allow websites to syndicate content to subscribers who wish to keep current with content updates. They are popular with blogs and news sites. Subscribers need a piece of software on their computers (present in most web browsers today) to manage their subscriptions and receive content updates.

User defined tags offer a simple yet powerful approach to improving content search and empowering individuals to categorize content and create connections based on keywords. Authors annotate their content submissions with tags (keywords) of their choosing as opposed to using a taxonomy prescribed by the website. The website aggregates tags across content submissions and displays a list of the most popular tags and submissions so that users can get an instant view of the 'hot' content and get better connected to the user community.

Despite the limitations of the current tools, it should become clear that there is a tremendous amount of technology support for collaboration that can be combined and applied to enable business scenarios of today and tomorrow.

“Bob and Susanne”: A Digital Collaboration Scenario

Following is a scenario that illustrates a vision for digital collaboration, demonstrating how an enterprise will be able to take advantage of new technologies and tools to improve individual and organizational productivity.

A global pharmaceutical company is planning clinical trials for a promising new drug. Bob is the project manager assigned to estimate the cost, timeline and work plan for the trials. Susanne is the medical director for that line of drugs and will be responsible for medical safety during the trials. Bob is based in New Jersey and Susanne in Switzerland. The company has a strategic relationship with a third-party contract research organization (CRO) that provides expertise and resources to help them conduct the trials.

Bob relies on Susanne's expertise with the treatment protocol and past experiences with similar trials in order to develop as accurate a plan as possible. Both of them need to interact with the CRO to ensure medical oversight and overall implementation of the

plan. They have set up a web-based workspace to share information for this effort.

It is 10:45am on Tuesday in New Jersey and Bob is reading an email from Susanne which triggers some questions that are best handled through a real-time conversation. From within the email application, Bob can see from the icon next to Susanne's name that she is 'online' and he initiates a phone call by clicking on her name and selecting the phone option.

It is 4:45pm in Switzerland and Susanne is wrapping up her business day and therefore monitoring her incoming phone calls. She has changed her presence setting to 'offline' but has kept it as 'online' for her family members, customer contacts, her manager and Bob. Her IP phone displays Bob as the caller and also includes the subject line of her original email to Bob so she can factor that in her decision to pick up the phone.

Susanne answers the phone and they discuss Bob's questions which are about a potentially serious adverse reaction by subjects in the trial. They decide they need to consult a subject matter expert in order to properly evaluate and manage this risk but neither of them knows a specific internal or external person with this expertise.

Bob invokes a communications agent which is a software application that allows him to find and connect with people associated with the organization. He has the ability to search on a variety of parameters like name, location, organization, skills, cost, availability et cetera. Information on relevant external people is available to the agent and Bob's search yields an individual from the CRO organization that matches the requested expertise. After reviewing the resume and cost for the expert, which have been made available by the CRO, Bob and Susanne agree that this person is worth consulting for their trial.

Bob then uses the agent to organize a virtual meeting with the external expert. The agent automatically reviews their calendars to propose a meeting time for Wednesday. It also creates a dedicated area in the project's workspace that Bob and Susanne can use to make relevant documents available to the expert. Last, it provides the call-in number for the meeting to all parties.

Later on Tuesday, Susanne works from home to prepare for the meeting with the expert. She has a local copy of the project workspace on her laptop which synchronizes securely over the Internet with the corporate version. She searches through the workspace looking for relevant documents to share with the expert who has availability to read through them before the meeting. She moves these documents to the dedicated area of the workspace that was created by the communications agent. The external expert has access to only this area of the workspace. Documents moved into this area have restrictions on them in keeping with corporate policy. They cannot be edited, downloaded to the expert's computer or copied/pasted.

Susanne notices a lot of new content as she goes through the project workspace. When the workspace was created, it was classified as a workspace to support a clinical trial

which led to it being automatically populated with a standard content set relevant to trials. Additionally, a content subscription was established to automatically update the workspace with content tagged as pertinent for clinical trials as well as content that matches custom tags specified by Bob and Susanne. As a result, the workspace receives ongoing updates from a variety of corporate information sources like discussion groups, Intranet sites, document repositories et cetera. The workspace receives updates in accordance with the information security policy of the organization which takes into account factors like the privacy classification of the individual content items and the access rights of the users in the workspace.

Most of the updates have to do with a new regulatory compliance policy and include corporate communications and discussions on how various ongoing projects are putting the policy into practice. Susanne notices that there is a new community formed on the Intranet for this topic and she adds herself to it. She also infers from the content abstracts that someone from regulatory affairs now needs to sign off on the project plan for the trial and it would make sense to invite them to the conversation with the CRO expert. One of the employees in regulatory affairs has the highest rated content submissions on the Intranet and seems to be the de facto expert. Susanne forwards the meeting request to that person.

On Wednesday, the CRO expert has a lot of questions for Bob and Susanne based on the documentation they have provided. One of the questions gets into the details of the data from the preclinical phase of animal studies. Bob opens up the word processing document containing the narrative summary from those studies and clicks on a preset link that connects the document to the corporate database containing the detailed data and is able to answer the question.

The regulatory expert that Susanne had invited was not able to make the meeting due to the last minute request but was very interested in hearing the CRO expert's position. Another person from the Australian office saw a note from Susanne in the community and would have liked to join the meeting but could not attend in real-time due to her remote time zone. The conference call between Bob, Susanne and the CRO expert is recorded and synchronized with meeting artifacts. The two interested parties, who could not join live, watch a replay of the meeting and use the ability to skip to specific time sections and speakers in order to focus on the CRO expert's view.

We live in a world where business policies and practices are changing at a much faster rate than ever before. The total amount of information is reportedly doubling every year and knowledge workers are spending an increasing part of their day looking for the right information or the right people.

In contrast, Bob and Susanne are able to maximize their focus on the business aspects of their jobs and accomplish in 24 hours what typically takes several days in most organizations. In the process, they experience a rich social connection to their colleagues and third-party experts which allows them to grow as professionals and individuals. They rely heavily on technology for the mundane tasks necessary for the

business.

Most of the technology piece parts to enable the scenario are available today in vendor offerings or will become available in the near future. What is missing in most enterprise IT environments is a holistic and proactive view of the architectures and services needed to deliver end-to-end collaboration scenarios.

Technology Services for Digital Collaboration

In the 1968 film classic, “2001: A Space Odyssey,” HAL the supercomputer interrupts a routine conversation between two people to convey critical information. This illustrates a key point about the value of connecting people to information. When the HAL “application” needed to communicate, it didn’t just have a blinking icon on a terminal in a computer room. Instead, it connected people to information in a timely manner, using a voice, the most appropriate and preferred medium for reaching people.

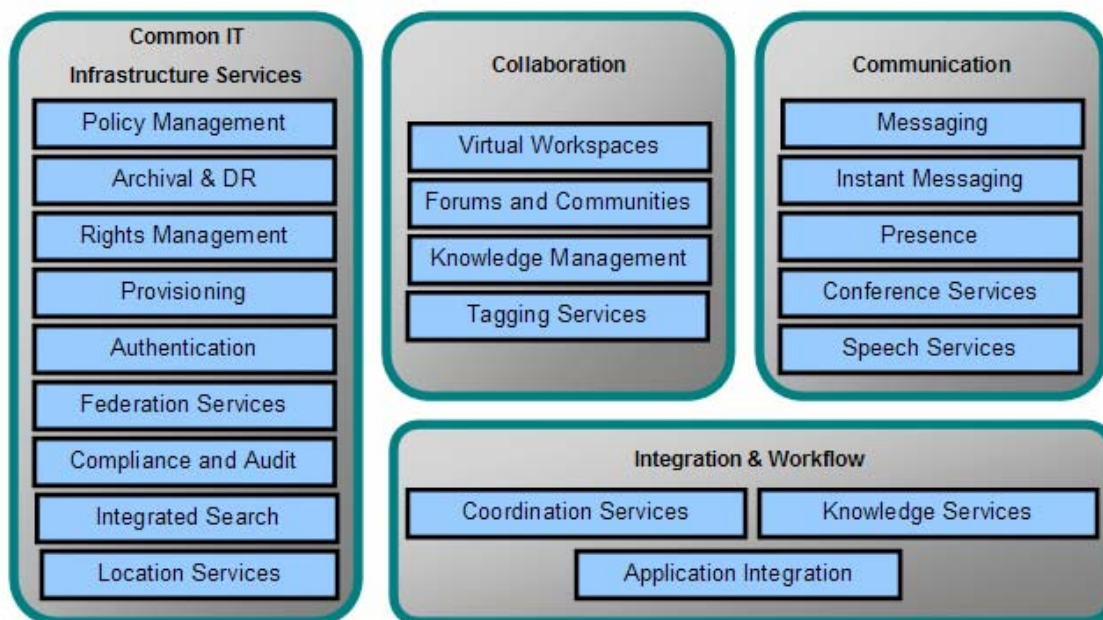
With HAL as our inspiration, we examine the technology services needed to better connect people with information and with each other. Specifically, our vision for digital collaboration in the enterprise is built around three areas where we see the most opportunity to create breakthroughs in efficiency, decision making and productivity:

First, the “tagging” of people, content and physical assets with context information (semantic keywords, presence, location, business processes et cetera) as a mechanism to automate discovery and usage of information and expertise.

Second, enabling and fostering the development of user-driven content and communities to maximize employee contributions and connection to the organization. Transforming ideas in people’s heads and laptops into broadly used organizational assets and harnessing the power of communities as proven by the Internet.

Third, connecting the world of the knowledge worker with the operational view of the enterprise and with relevant external information that is critical to effective decision making,—i.e., integrating familiar, easy-to-use spreadsheets, email, and virtual workspaces with information from corporate systems like ERP/CRM and third-party services. This integrated view must be delivered to the individual in the right format at the right time and on the right device.

These services need to be provided in concert with the broader enterprise IT infrastructure and communications services. The picture below depicts a holistic set of services to enable digital collaboration and scenarios similar to that of Bob and Susanne.



The services are combined using a service-oriented architecture (SOA) approach in order to maximize flexibility in usage scenarios and the ability to change the underlying technology implementation as needed.

Tagging

Tagging is a simple mechanism to connect information and people by attaching descriptions about an entity to its digital representation. The entity in question might be a person, a physical asset that can be tracked through mechanisms like RFID, or electronic documents and other content that is “born” digital. Tags can describe any useful information about the entity – keywords to describe documents is the most common example; other tags might be location, availability, participation in a business process or relevant skills and experience when it comes to people – basically any information about the entity that can enable its discovery and usage.

Despite the obvious benefits of tagging, most of the information in today’s corporate environments is not tagged in ways to enable broad discovery and usage. A typical quest for information begins with known sources like a colleague, a business application or an electronic repository. Broad searches are typically content-based, matching desired keywords with contents of documents inside the organization or on the Internet. This approach to search is both very popular and useful but is largely a brute-force approach requiring technology capacity to index the content universe, and it does not take into account the context in which the search inquiry was made. Context-rich searches based on tags can provide a richer complement to content-based searches and should become the default as critical mass of information is tagged. Additionally,

end users should have the ability to create tags dynamically if the existing tags do not provide an adequate description. This allows for much more organic and dynamic annotation and ultimately usage of information than is possible through centrally controlled and predefined taxonomies alone.

Tagging services are needed to simplify and automate the creation, usage and management of tags by the enterprise. These services integrate with authoring tools, content repositories, content publishing and search interfaces to display taxonomies and usage statistics of existing tags and to allow users to attach and create tags for their content. They work with enterprise directory services, HR applications and cross-enterprise federation services to make the people related connections. Tagging services integrate into communication services like email, instant messaging, conferencing as well as integration and workflow services to extend the reach of tags into back office applications and business workflows.

User-driven content and community

Many collaboration constructs from the Internet can be applied in enterprise environments to increase employee engagement and develop vibrant communities of interest. These constructs have the strategic effect of moving valuable ideas and information from the heads and laptops of individuals into centralized and reusable formats that can benefit the entire enterprise.

Personal expression and recognition among peers are powerful motivators as evidenced by the explosion in the number of Internet blogs and user-generated content sites. Applying these dynamics to increase the profile and involvement of employees with specialty skills and experience unlocks the value that would typically be limited to their immediate projects and department colleagues. More broadly, it enables richer connections between employees that are increasingly working from home and globally dispersed office locations -- not to mention that the next generation of knowledge workers will expect these tools as 'standard issue' in their work environment.

In most organizations today, electronic communities provide a convenient forum for people with common interests to network, share content and occasionally transact business. However, as shown by eBay[®], Amazon.com[®] and Wikipedia, once critical mass is achieved, the real power lies in the aggregated views and expertise of the community. Supported by the right culture and incentives, vibrant communities can make a broad impact across the business processes of an enterprise. For example, communities can be used to get timely customer feedback on new products and improve the on-boarding experience for employees that are new to a project or organization. Additionally, the aggregated view of a community becomes a tangible corporate asset that persists after individual members leave the organization.

Technology services are needed to allow users to create and maintain personal pages, blogs, wikis, workspaces and community forums in a self-serviced manner. These

constructs need to be integrated with authoring and communications interfaces to provide a seamless user experience. They leverage infrastructure services like access control and backup as well as services like tagging, subscriptions and alerts in order to automate the creation of information pathways and people connections. Enterprise Intranet taxonomy and search interfaces need to be updated to account for these constructs. Virtual workspaces and community forums should allow for the automatic population of relevant content and links at creation time and provide real-time data on content usage like “most requested”, “most viewed” or “highest rated.”

Integration of Knowledge Worker and Operational Environments

Knowledge workers need to have the most accurate operational data available to make decisions and complete their tasks. This data should be delivered to them at the point of need as opposed to requiring them to go to a separate application interface. They should also be able to update back office systems from their preferred application interface. Digital collaboration relies on breaking down the barriers that have traditionally separated the decision support systems and the transactional systems in an enterprise.

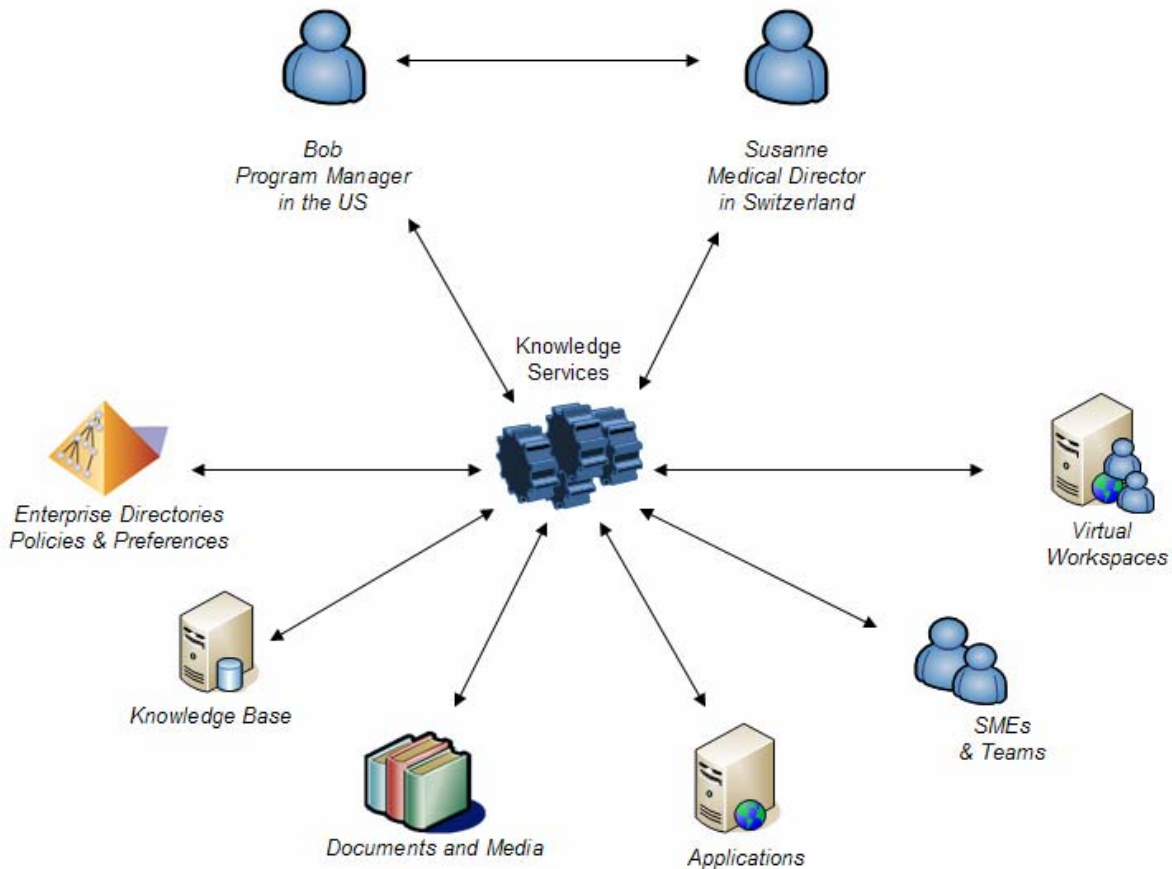
SOA style services are the backbone for this integration. Most commercial applications and increasingly in-house applications have invested in services that programmatically expose data and functions from back office systems. Commercially available or custom integration layers are needed to invoke these services from within the documents and applications used by knowledge workers. This integration layer should coordinate with the broader use of tags in the enterprise as well as core infrastructure services like identity and access management.

Knowledge Services

With tags and content-based search in place to better connect information and people; with critical mass of content in user pages, blogs, communities and workspaces; and with an integration mechanism for back office information - the enterprise can develop higher-order knowledge services that build on these and the core infrastructure and communication services to deliver powerful enterprise-wide searches, automatic content updates and even look for hidden connections between content and people.

One example of such a service is the search used by the Communications Agent in Bob and Susanne. This service was used to search for an individual based on expertise. The search spanned different systems and content formats across the enterprise and extended into the CRO organization using security federation services. It applied rights management and other policies to ensure appropriate use of information. It populated a secure area in the virtual workspace and provisioned an external user with the appropriate rights.

The following picture depicts the broad set of services that knowledge services interact with in order to automate the completion of a higher order task.



Coordination Services

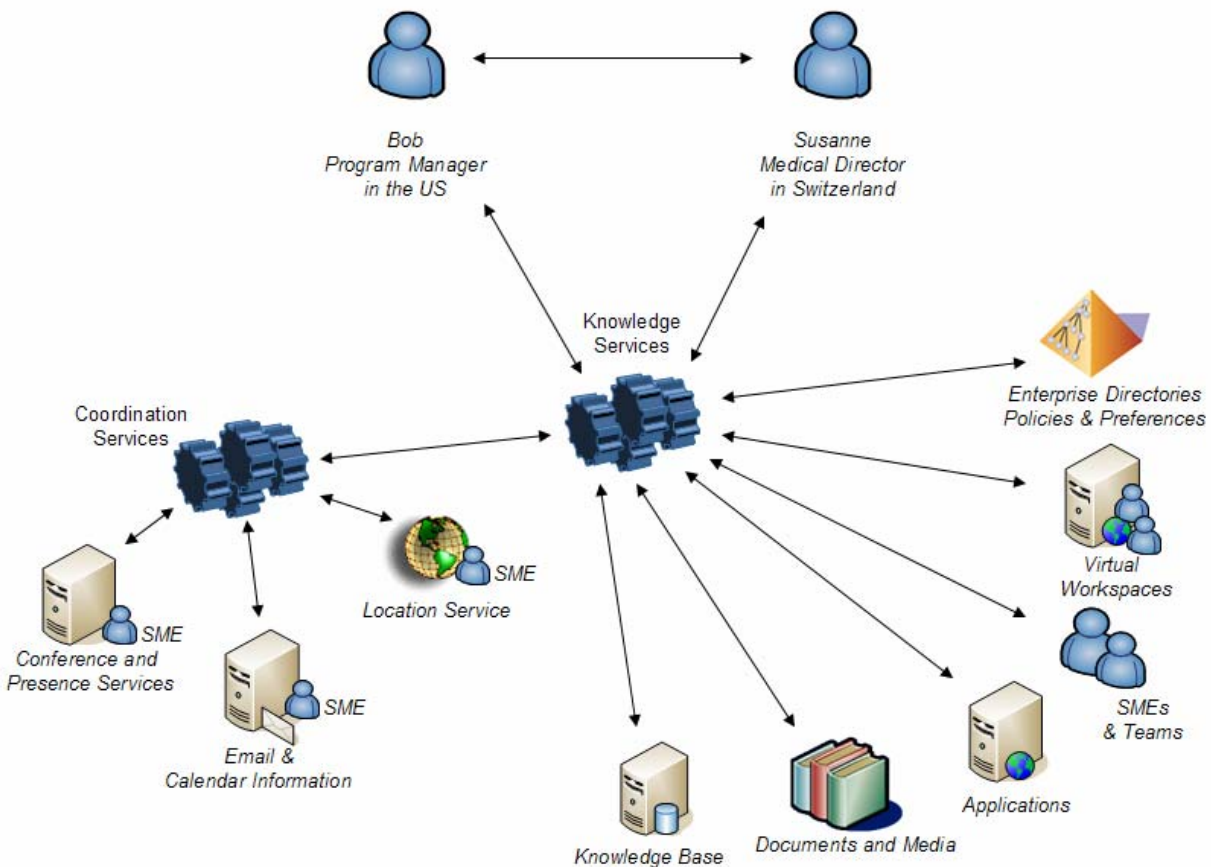
Coordination services is another example of a higher order service that combines calendaring, presence and location information to determine the availability of an individual and the best communications mechanism to contact them.

Calendaring services provide information about a person's schedule. Presence information conveys their more immediate availability (online, busy, on-the-phone et cetera). Location services use GPS-enabled devices to provide information about geographic location information along with real-time speed and direction information of people or physical assets.

The person initiating communication will not necessarily have access to presence and location information. In this case, Coordination Services helps decide upon the most appropriate form of communications and will perform transformations to use the optimal format and device.

For example, when Bob and Susanne contacted the CRO expert, Coordination Services determined that she was not available for an immediate conversation and worked out a suitable conference time for all parties the next day. Coordination Services also determined from location services that the expert was traveling at 70 miles an hour, and sent a voice message alert instead of a text message informing her about the high priority customer meeting the next day.

The following diagram depicts Knowledge Services working with Coordination Services to help Bob and Susanne schedule a meeting with the CRO expert.



Infrastructure and communications

Infrastructure and communication services are not covered in this paper but clearly they are pre-requisites for digital collaboration. In particular, authentication, access control and audit are paramount to ensure compliance with data privacy regulations and to secure the sponsorship necessary for this style of collaboration. IP-based unified communications is an essential building block and the first step to the business benefits of digital collaboration.

Conclusion

We believe that collaboration is an organizational capability that will become increasingly vital to business success and, further, that “**digital collaboration**” - the use of technologies to enable efficient and valuable connections among people and information - represents the area of IT with the greatest potential for improving business performance in the next five years.

Our vision is based on driving breakthrough productivity benefits by attaching context to people and information; by fostering user-driven content and communities that transform ideas and collaboration from smaller, private forums into broadly available organizational assets and by connecting knowledge workers to the operational systems of the organization for better decision making and faster completion of transactions and business processes.

In order to realize the full potential, Avanade believes that IT departments will need to provide new service offerings and take a holistic and proactive view on the enterprise architectures and tools required for digital collaboration.

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