

Making Collaboration Technology Work for the Enterprise: A Process-Oriented Perspective

Enterprise Social Collaboration - 2011 White Paper #1



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Alex Kass

This point of view discusses why effective collaboration is becoming a first-tier concern for enterprise leaders. It describes how technology can dramatically improve the ability to drive effective collaboration, and how to weave a *process-oriented collaboration-technology strategy* that delivers the intended business impact.

This point of view is a joint effort of

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Executive Summary

The days when enterprise leaders could afford to ignore the need to support collaboration are over. As the products and services of the modern enterprise have increasingly outstripped the expertise of any one person, any one department or even any one company, effective collaboration has become an increasingly crucial component of business success. At the same time, factors such as the size, structure, and distributed nature of the typical enterprise can create challenging roadblocks to effective collaboration, making it important for management to support collaboration with carefully crafted initiatives, including the right technology.

The basic technology-enabled collaboration toolkits and platforms – which include communication, coordination, and knowledge-sharing, have now become fairly mature. However, not all enterprises that invest in collaboration technology get the impact they expect: throwing collaboration tools at the workforce has not proven sufficient to drive effective collaboration. In the worst case, collaboration technologies can become expensive shelf-ware or even time wasters. Because collaboration can be hard work, and using collaboration technologies involves some amount of overhead, driving effective collaboration requires a collaboration strategy that connects the dots between specific business impacts sought; process changes required; collaboration activities involved; and technologies needed to facilitate those activities. Effective adoption of those collaboration technologies can be advanced by integrating them as deeply as possible into the business processes they will support, and by automating away as much of the overhead as possible to reduce collaboration overhead.

In this Point of View, we'll elaborate the specific reasons collaboration is so important to the modern enterprise, how various technologies support collaboration, how to align your collaboration solution with targeted process improvements, and how to weave a collaboration solution that keeps the overhead of collaboration as low as possible.

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Collaboration technology is emerging as a first-tier concern

Although the business culture has traditionally tended to promote the view of the outstanding individual as the source of business results¹, enterprise leaders are increasingly recognizing that effective collaboration is, as one author puts it,² a crucial “force multiplier” needed to make the most of individual talent. *Effective collaboration amplifies the enterprise’s human capital.*

As a recent survey illustrates³ collaboration, and the technologies that support it, are emerging as first-tier concerns for the modern enterprise:

- **85%** of C-level executives indicated that they believe that enterprise-wide collaboration is more important than individual specialization for success.
- **75%** indicated they plan to increase the use of communications and collaboration technologies in the following year.

Although a few business leaders may still think of collaboration as a touchy-feely issue, these survey results demonstrate that a growing number realize that it’s not about group hugs, it’s about getting the work done: Since the complexity of the modern enterprise’s products and services almost always exceed any one person’s scope of expertise, *both operational efficiency and the ability to innovate increasingly depend on getting the right people to work effectively together.* And world-class collaboration increasingly depends on technology. The right technology, deployed with an appropriate collaboration strategy in place, can play a critical enabling role in many important forms of enterprise collaboration. Evidence that enterprise leaders are coming to appreciate the role that technology can play can be found in another recent survey³, which indicated that improving workforce productivity was the most frequently named significant accomplishment that CIOs expected to make in the coming year, and as the results above show, effective collaboration is a key part of that.

Collaboration technology is a key enabler of many modern business processes

We define effective collaboration as people, groups, or even companies working together to execute some business process more effectively than they could alone. Increasingly, these collaborations are mediated by technologies supporting some combination of communication, coordination, or knowledge sharing.

Collaboration technologies support a broad range of business activities that involve the interaction of four elements: People, processes, knowledge, and work-products. Business functions that increasingly rely on technology to support collaborative interaction range broadly, from strategic-decision making by executive management teams, to day-to-day customer-service teams.

Collaboration is sometimes equated with communication, but the two are overlapping rather than identical concepts. Sometimes direct communication is central to collaboration, as when two workers discuss a problem that neither has knowledge to solve alone. This communication can be synchronous/real-time (as with audio or video conferencing) or asynchronous, as with email or discussion groups.

Other forms of collaboration occur without direct communication between the collaborators, as with crowdsourcing, where a group of contributors who may not even know each other each contribute pieces of solution, and then review or edit each other’s contributions, or when one worker re-uses an asset that another has shared on an intranet site.

As evidence of the importance of effective collaboration, consider that companies which have won the North America MAKE prize (for outstanding knowledge management / collaboration) outperform the overall market in terms of total shareholder return, profits as a percentage of assets, and profits as a percentage of revenue⁴. When you work well together, you operate more efficiently, you can create better products and services, and you can do a better job selling what you’ve created. Some

examples of the kinds of results often seen from effective collaboration initiatives we are aware of appear in the *Sample Results* table on this page.

Four key reasons why *now* is the time to focus on collaboration technology

Collaboration has always been important, but the role of technology has traditionally been limited to providing fairly general-purpose communication channels such as phone and email. Why is *now* the time to focus more deeply on collaboration technology? We have already discussed one important factor, which is the maturation of the underlying technologies. But this really is not the only factor, maybe not even the most important one: A *combination* of business trends and technology trends are driving an increased focus on collaboration technology. The four most prominent drivers we hear about from clients are 1) maturation of collaboration technology; 2) increases in product and service complexity; 3) geographic distribution of the workforce; and 4) the ‘collaboration-friendly’ nature of the upcoming generation of workers.

The bottom line is this: Collaboration looms as a key enabler of effective operations in the modern enterprise; consistently driving the needed collaboration is quite a challenge; technologies that can help support needed collaboration are available, but to get effective adoption those technologies requires carefully crafted solutions that align technology, activity, and business objectives. The rest of this paper aims to provide a path to understanding the specific collaboration needs an enterprise may have and weaving a solution that will meet those needs.

Sample results of successful collaboration initiatives

Global Telco

- 102% sales conversion rate increase
 - 23% increase in employee productivity
 - 16 point customer satisfaction increase
 - 75% faster time to competency from combined workspace and learning program
-

Leading Hardware & Services Provider

- 10% increase in sales quota attainment by top users versus non-users
 - 20% productivity gains for professional services group reinvested in growing the business
-

Leading Software Company

- 10+% increase in productivity
- \$11 million in cost savings
- Increased capacity, win rate and deal size

Key trends driving uptake of collaboration technologies

Driver	Description
1. Maturing collaboration technology provides more reliable and powerful tools	<p>The elements of a powerful collaboration toolkit are now available from several vendors.</p> <p>Some of the core tools that have matured in the last couple of years include secure, federated instant messaging; high-fidelity video conferencing; enterprise social networking tools; advanced enterprise file-sharing and search.</p>
2. Increasing complexity makes effective collaboration more important	<p>The typical enterprise's products and services have grown increasingly complex, while market pressures also demand constantly improved quality and reduce cycle times.</p> <p>Consider, for instance, that only a couple of decades ago, the design of a new car took close to 60 months, while today's market demands that it takes around 24-36 months, despite the dramatically more sophisticated nature of today's automobiles. Meeting quality and complexity standards on short timelines necessarily requires highly efficient, effective collaboration among all disciplines within the company, as well as with partners throughout the value chain.</p>
3. Geographic distribution and other factors make collaboration more difficult	<p>Factors such as globalization and 'virtualization' of the enterprise make collaboration increasingly difficult without an increased level of support.</p> <p>For instance, 1 in 4 workers spend at least 1 day per week working remotely. And co-workers who previously may have worked in the same city may now be distributed around the globe, in different time zones, often different cultures.</p> <p>Modern management techniques can also be an inadvertent deterrent to collaboration: The modern enterprise's focus on individual accountability and measureable performance objectives may actually discourage collaboration in some quarters, in favor of maintaining focus on individual metrics.</p>
4. The new generation of workers considers collaboration technology a must have	<p>Generation Y might just as appropriately be called the SMS/Facebook/Twitter generation: They enter the workforce with social networking and information-sharing baked deeply into their worldview.</p> <p>Their most prominent model of an information resource is likely the crowd-sourced Wikipedia, and their approach to finding out how to do something may well be to pose a question to their social network.</p> <p>Technophobia is not a big risk with this population; instead, the risk is that the collaboration affordances offered by their employer will fail to measure up to the high expectation they developed outside of work.</p>

Realizing the potential of collaboration technology

The current state of collaboration technology is a bit of a good news / bad news story: The good news is that vendors of collaboration tools and platforms have come a long way in the last few years, significantly maturing several key technologies for communication, coordination and knowledge sharing. The bad news is that unlocking the value of those technologies within an enterprise requires more than merely supplying end users those technologies. In the rest of this section we'll consider brief overviews of both sides of that equation.

Core technologies in the collaboration toolkit have matured

The maturation of network infrastructure, tools, and devices makes it feasible to support effective collaboration in ways not possible a few years ago. A number of key technologies that were recently exotic are now commonplace. Here are some examples:

- High-quality audio and video-conferencing can be supported affordably, often leading to significant reduction in travel, while increasing the frequency of higher-touch interaction between distant colleagues;
- Intranet publishing and enterprise search can combine to make knowledge sharing much easier, leading to increased reduction in time wasted reinventing the wheel;
- Remote file access and screen sharing / remote assistance make distance much less of an impediment to rich, multi-media communication;
- Modern team coordination sites make it easier to coordinate with colleagues across the hall or across the ocean;
- Powerful unified communications packages that make it easy to see when remote colleagues are available, and to reach out over whichever of many possible channels best suits the situation; and
- Convenient mobile access points, including smartphones and tablets mean that it is about as easy to collaborate when colleagues are away from their desks as when they're at them.

In addition to the traditional on-premise approach to supporting collaboration technologies in the data center, many vendors now offer cloud-based versions of these technologies, which can make them easier to manage and to scale. In short, the core communication, coordination, and knowledge-sharing toolkit for collaboration - has come a long way recently, and can now be considered fairly mature.

The appendix at the end of this document contains some briefly-illustrated examples of the collaboration toolkit applied to achieve various business benefits.

It takes more than the core toolkit to drive effective collaboration

Unfortunately, despite the maturation of the core collaboration technologies, not all organizations that invest in collaboration achieve the kinds of results described above. We hear about many organizations that have responded to a generalized sense of need for collaboration by simply deploying a toolkit and then announcing that employees should use those tools to improve collaboration. What they often find is that without ensuring that the technological, organizational, and process-design elements of a collaboration initiative are aligned with clear business objectives, adoption of the tools turns out to be spotty, and the impact on the business difficult to measure. Without a comprehensive, well-articulated plan connecting collaboration to specific business results, collaboration technology can become expensive shelf-ware. And pushing folks to collaborate for collaboration's sake can actually be counter-productive: As a number of authors have pointed out, bad collaboration is worse than no collaboration at all.

You need to support the full enterprise collaboration stack

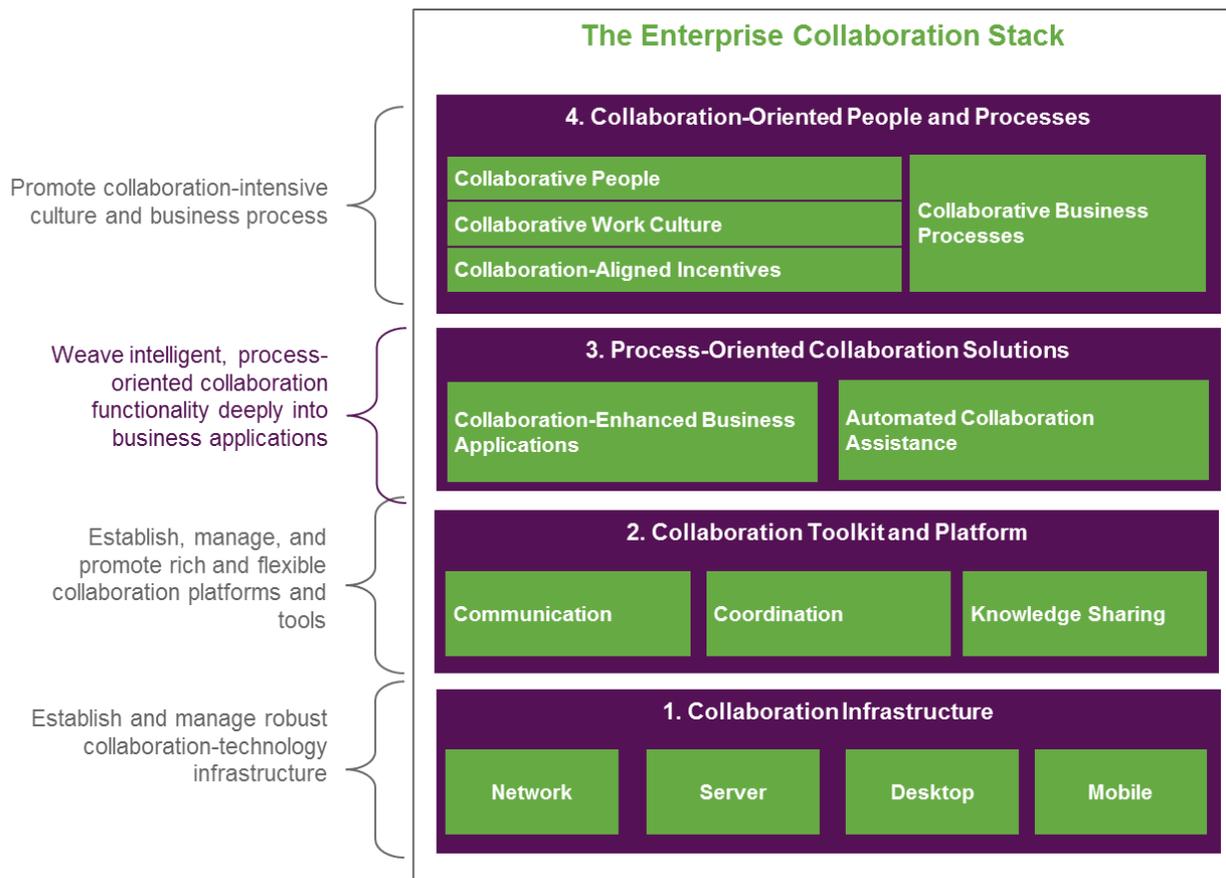
To understand what it takes to drive effective collaboration, we've found it helpful to think about enterprise collaboration as a kind of stack that extends beyond information technology elements. The diagram below depicts the four main layers of the stack, along with the key actions that business and IT leaders must take together to drive effective collaboration. From the bottom up:

1. **Collaboration infrastructure:** Network and communication infrastructure needed to support conferencing, and asynchronous sharing with adequate levels of reliability and quality of service.
2. **Collaboration toolkit and platform:** Provides communication, sharing, and coordination tools, often in the form of extensible platforms which include both server-side and client-side/desktop components.
3. **Process-oriented collaboration solutions:** This important, but often overlooked, layer is responsible for aligning collaboration tools with business processes. It involves enhancing some business applications with collaboration affordances. In more sophisticated instantiations, these enhancements are customized to directly support target processes. Going forward, we expect to see increasing levels of automated assistance being applied to the target processes.
4. **Collaboration-oriented people and processes:** Selecting employees for collaborative attributes, incentivizing, and training collaborative approaches to work, and designing business processes that explicitly make time for

collaboration can also be key pieces of the collaboration puzzle.

The bottom two layers of the stack consist of hardware and software elements that are provided by collaboration-technology vendors. As we've noted earlier, those technologies have been rapidly maturing in recent years. The top layer, which focuses on people and processes must be addressed by HR and business leaders; it is critical to address the issues in this layer, but those issues are well-covered by business-oriented books on collaboration so that top layer is largely outside the scope of this Point of View on collaboration *technology*.

We believe that key layer which needs attention to drive maximum ROI from collaboration technologies is the third layer up. This collaboration solution layer involves bridging the gap as seamlessly as possible between the core technologies found in lower levels and the business-process impacts sought in the higher levels. This layer will be the main focus of the rest of this paper.



Introducing the process-oriented approach to driving effective collaboration

A key lesson we have learned about collaboration technology is this: Although the maturation of core technologies for collaboration creates great opportunities to leverage technology to drive effective collaboration, you cannot afford to let that lull you into the wrong mindset! To drive strong impact from your collaboration initiative, don't start by asking which of the cool new collaboration tools you should get. Instead, right from the outset you need to think in terms of what processes you want to change through improved collaboration and which collaborative activities can facilitate that improvement.

At Accenture, we believe that the focus on collaboration toolkits must evolve into a focus on process-driven collaboration initiatives⁵.

We define a process driven collaboration initiative simply as one that is structured around collaboration solutions which focus specifically on driving the effectiveness of clearly-identified processes. This means improving the efficiency of the process, and/or the quality of its output by improving the way the participants in the process communicate, coordinate and share knowledge – both amongst themselves, and between themselves and other relevant people who may not be directly involved in the process.

We organize the process-oriented strategy for driving effective collaboration into six work streams, and we divide the components of the strategy into two sub-groups, the core work streams, and the advanced and emerging work streams, as depicted in the chart on the next page.

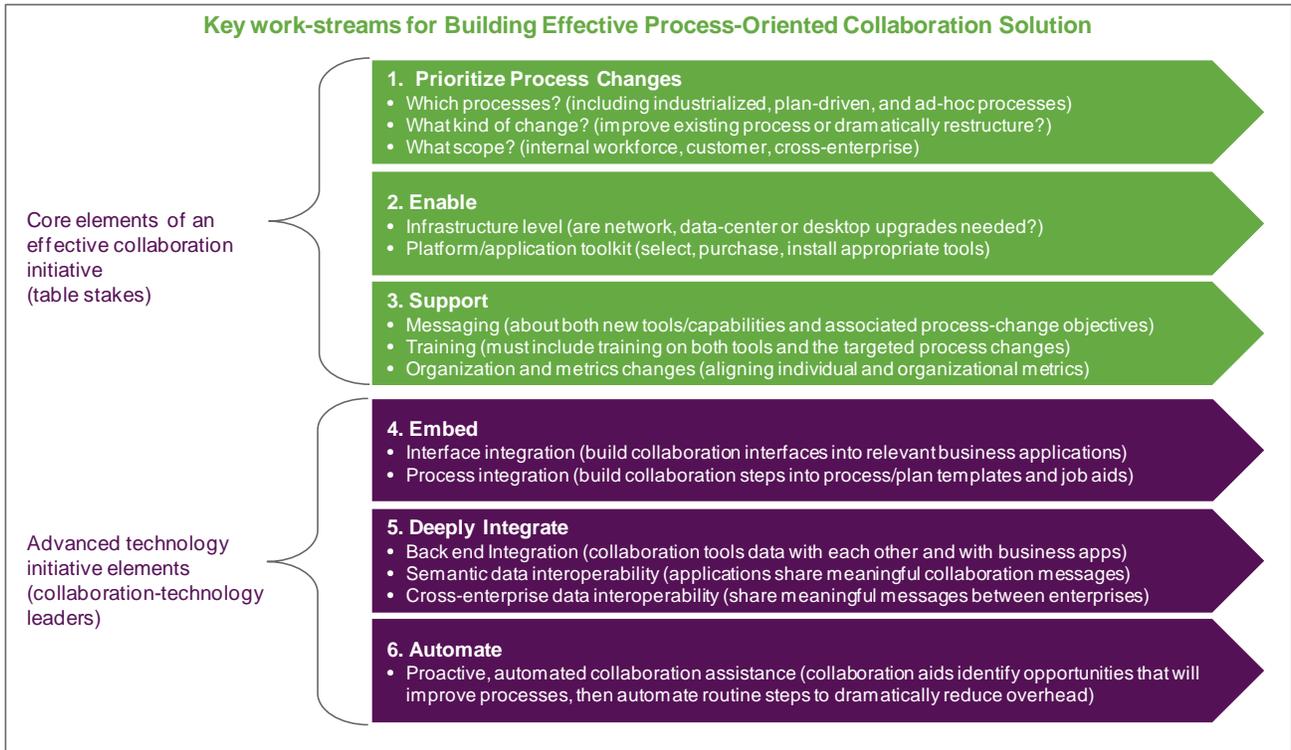
1. A needs analysis work stream that targets specific process changes to be addressed through improved collaboration;
2. An enablement work stream in which the technology needed to achieve the targeted

collaboration activities is selected and deployed, and

3. A support work stream in which the technology is maintained, messaging developed, training, performance support, and incentives are rolled out to support the collaboration technology and the improved collaborative processes those technologies enable.

Advanced and emerging work streams involve more advanced measures that can dramatically increase the chances, and the likely size of the impact of a collaboration technology initiative. Over time, we see the technology itself evolving into increasingly sophisticated process-based collaboration platforms. In this new process-oriented collaboration paradigm, the underlying collaboration technologies are embedded in the applications that workers use to execute targeted business process. As the technology evolves, we expect it to get smarter about the business processes in which it is embedded, incorporating knowledge of the process to provide more targeted, proactive collaboration assistance. The work streams in the advanced group include:

4. Embedding collaboration into the tools used to execute target processes;
5. Integrating the business applications with the collaboration tools deeply enough that they do not merely pass data between them, but actually pass meaningful, "intelligent" messages that users and technologies can act on; and
6. Increasing automation, with tools that proactively handle management of collaboration functions and support automated knowledge sharing with a minimum of effort required on either the publishing or retrieval end.



Flexible support for embedding (stream 4) and integration (stream 5) is becoming common in the latest-generation releases of vendor products. Intelligent collaboration-automation technology is currently emerging, and we expect it to be a bigger factor in the technology strategy of collaboration leaders. We envision this advanced technology making extended collaboration much easier both within the enterprise, and across enterprise boundaries that include suppliers, partners, and customers. And we eventually expect to see this lead to a much more agile model of the workforce, with a more fluid, dynamic model of teaming that allows optimized assignment of people tasks that suit them.

Collaboration R&D groups in our lab and elsewhere are working to realize the most advanced versions of this vision. But you don't have to wait for more advanced, smart collaboration technology to get started with an initiative that will drive more effective collaboration. You can start effectively leveraging today's technology with a straightforward *process-oriented strategy*, identifying clear business-process changes that need to be made through effective collaboration, determining the roadblocks that currently discourage the needed collaboration, and

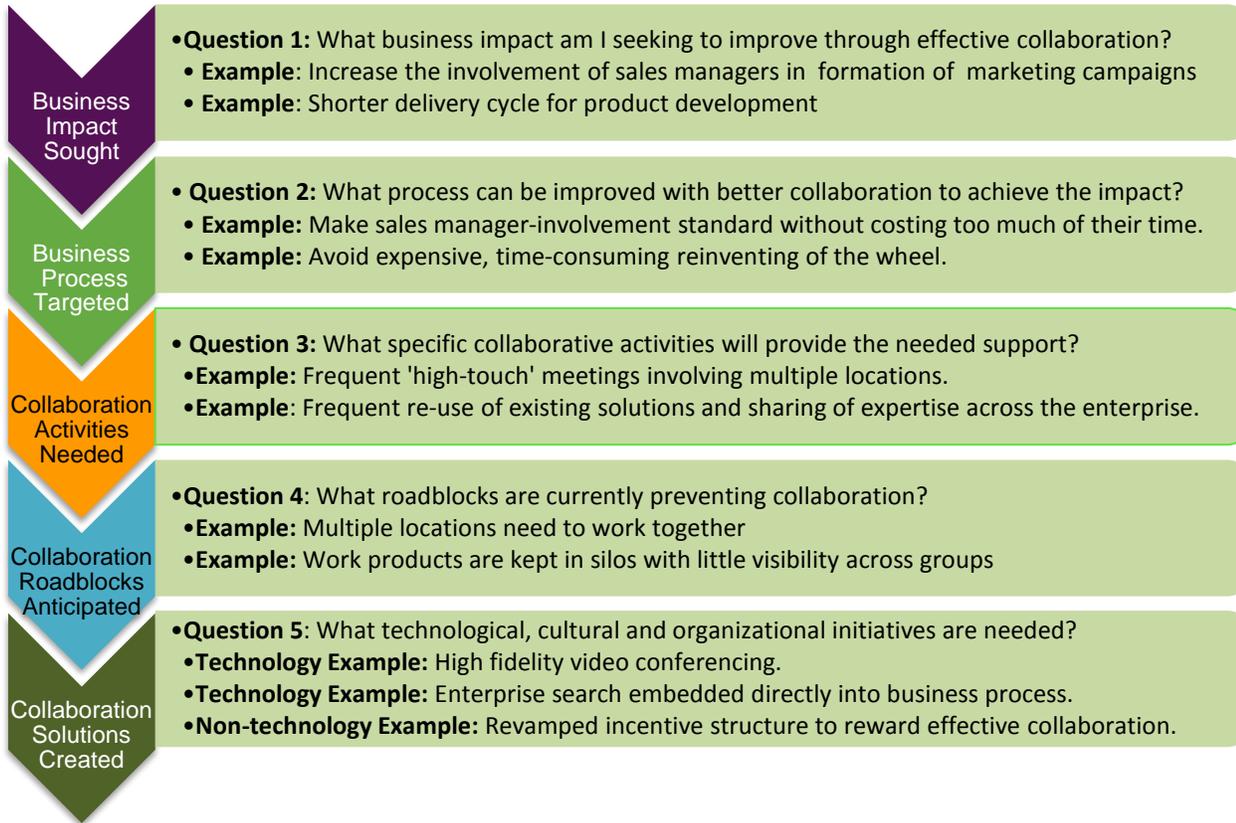
then matching technologies, organizational, and process support to meet the identified need. This will yield near-term benefits, and will also position you well to leverage the technology advances we see coming.

In the rest of this Point of View we'll provide a framework for analyzing collaboration-technology priorities, and putting together collaboration solutions to address those priorities. We'll start by walking through five analysis steps that constitute a process to identify what the real issues are, and which tools can help. And then we'll look a bit more closely at the other work streams that drive the effective collaboration that addresses your priorities.

Defining a process-oriented collaboration initiative: Five key issues

To start down the path to fostering effective collaboration, you must start by beginning with the end in mind, and then connecting the dots between the business need you seek to address, and the collaboration you will invest in to achieve that need. The framework on the next page enumerates five key questions to ask at the outset of any collaboration technology initiative.

5-Step Process-Oriented Collaboration Solution Analysis Model



A goal of this Point Of View is to help readers think about their answers to each of these questions. The first four questions above break the required analysis down into relatively straightforward steps, from business impact through the roadblocks that reduce the frequency or effectiveness of the required collaboration. By answering these four analysis questions, you lay the groundwork for answering the final question, which means designing the collaboration solution that addresses the issues you've identified.

ISSUE ONE: Business impacts sought

Any analysis of collaboration-technology needs must begin with an understanding of the specific kind of business benefit sought, meaning which process improvements to target with improved collaboration. Studies have shown that the enterprise that is able to foster effective collaboration stands to realize several concrete benefits⁶ including shorter delivery

cycles; higher quality products and services; innovation; organizational resilience; improved customer satisfaction; improved sales; deeper relationships between employees; and deeper relationships with partners and suppliers, and customers. The table below is not meant as an exhaustive list, but to help you organize your thinking around the most common types of benefits that we have seen, with some examples of contexts in which they have been achieved.

Common Benefits of Enterprise Collaboration

Benefit	Description
Shorter delivery cycles	Effective collaboration is a key to reducing cycle times at both big-picture and detailed levels. First, consider the intricate collaboration between people from different disciplines, often crossing organizational boundaries, required to bring a new product to market.
Higher quality products and services	Quality is driven by capturing and sharing best practices and by breaking through silo walls to bring the best available thinking together. Doing this requires making the identification and review of best practices a more explicit part of standard processes than it often is, building the time to do so into plans, and providing technology to make the search for best practices easier. It also requires providing, incentivizing and enabling the sharing of best practices. Since the benefits of sharing often accrue to different people than those who must do the work, it is critical to reduce the effort required by building the sharing mechanisms directly into to existing applications and processes.
Innovation enablement	It is well understood that cross-fertilization is a crucial ingredient of innovation. The silos that make execution efficient can make it difficult to achieve that cross-fertilization without giving explicit attention to providing technology, and organization support, for doing so. Addressing this involves modifying standard processes to get input from broader community and then providing the technological and other support to make that as easy as possible.
Organizational resilience	When people work in isolation, either intentionally or unintentionally hoarding knowledge, the organization is at risk from brain drain. With the looming retirement of boomers, and propensity of gen Y to job hop, it is critical to build knowledge transfer and knowledge sharing into as many day-to-day processes as possible to ensure that knowledge is not lost when people move on.
Deeper relationships with customers	Collaborating effectively with customers can drive both <i>deeper customer satisfaction</i> and <i>increased sales</i> . Solutions that improve richness of customer interaction, which in turn can improve of quality service, help build trust, retain customers, and increase opportunities for cross-selling.

Some real world examples of collaboration-technology impact

Here are some brief descriptions of examples of the kinds of impacts described as actually realized by real-world collaboration initiatives.

- **Example – new product development:** We recently worked with a Leading pharmaceutical company to implement collaboration across its R&D process, focusing on improving the ability to find and reuse prior relevant findings. Researchers were able to *cut weeks off of their elapsed cycle time*.

Effective collaboration can also impact cycle time on day-to-day activities. Consider, for instance, that good telephone customer service on any but the most routine issues often involves sharing knowledge between multiple CSRs with varied areas of expertise.

- **Example – customer contact:** A large telecommunications company we recently worked with designed and implemented an initiative making it much easier to find relevant knowledge

and experts while conducting a customer service call, by creating a single, consolidated portal bringing the relevant knowledge together in one place, thus *reducing the average call time by 23%*.

- **Example – knowledge retention:** A Large Consumer Products Company implemented a program to retain critical knowledge after consolidating several R&D centers. *Although headcount was reduced by 60%, new product launches occurred on time*
- **Example – knowledge sharing:** InnoCentive has used crowd sourcing techniques to solve *over 250 challenges, e.g., simplifying the manufacturing process for a TB drug from five steps to three steps*.
- **Example – team coordination:** A leading pharmaceutical company created a collaborative environment for market launch processes which enabled more consistent results in new drug launches. They increased their success rate for hitting revenue targets from 33% to over 50%.
- **Example – knowledge transfer:** A large telecommunications company implemented collaborative portals as part of the Next Generation Call Center for their main customer

service roles. *By giving the CSRs the right at-need information in addition to careful training, customer satisfaction rose 15%.*

- **Example – high-touch collaboration with remote customers:** in one recent study of wealthy US investors⁷ revealed that 63% *would consider moving assets to another firm to access two-way high-definition video* to meet with multiple experts.

ISSUE TWO: Business processes targeted

The business impacts described above are achieved by making various kinds of improvements to one or more business processes. In order to develop your strategy, you need to develop a collaboration repertoire – an understanding of the kinds of process improvement that collaboration (and collaboration technologies) can support. This is essentially identifying the key use cases. A successful collaboration initiative is also sure to encounter unexpected use cases as well those you identify up front, but in our experience, only by identifying some target process changes explicitly at the outset, will you be able to give focus to your efforts in the other streams of the strategy, ensuring you enable, support, and embed collaboration effectively. Because the uptake of collaboration depends heavily on network effects, getting a few, highly visible, use cases working well is important for bootstrapping future efforts.

To shape the thinking about your solution, think about three major sub-issues once you've identified processes related to the targeted business impact:

1. Classifying which types of processes are targeted for change.
2. Determining what kind of changes you need to make to those processes to achieve targeted business impacts: are they essentially efficiency improvements, or require more dramatic restructuring of the process (such as through crowdsourcing).
3. Determining whether the scope of the process changes are limited to collaboration within the enterprise workforce, or include cross-enterprise collaboration and/or collaboration with consumers, as these broader collaboration efforts involve additional technical issues.

Classifying the types of processes can be improved through collaboration?

When we talk about improving business processes through collaboration, one thing worth noting is that collaboration shows up in a number of different *kinds* of processes; it's important to consider the entire range. Three broad categories that are worth considering are as follows:

- **Highly-industrialized processes**, such as insurance claims processing or telephone customer services for a large government agency might fall into this category.

The work in this category tends to be transactional. The collaboration is often concentrated in handoffs resulting from issue escalation or seizing cross-selling opportunities. Collaboration also happens in more subtle forms of knowledge sharing, when a solution or best practice developed by one member of the workforce is adopted by another.

- **Plan/project-based processes**, such as development of a new product, launch of a marketing campaign, development of a software system. The work in this category tends to be more complex, the process looser but still documented. The work products often include large, unstructured documents, spreadsheets, plans, and designs. Collaboration can include joint brainstorming sessions or intricate synchronization of activity involving common work products, as well as the forms of collaboration involved in more industrialized processes.
- **Ad-hoc processes** are involved in responding to an unexpected opportunity or crisis. Distinguished from the other two categories by the lack of any pre-codified process. The work-products are generally structured on the fly. Collaboration challenges include all those experienced in industrialized and plan-based processes, with additional issues related to improvisation: For example, there may often be no clear leader or pre-defined responsibilities.

Using collaboration to optimize, or to restructure existing business processes

A key dimension to think about is how radically you are prepared to change existing processes. Regardless of whether you are working to improve a highly-industrialized process, a process-based process, or an ad-hoc process, it can be useful to organize thinking about the impact of collaboration on processes into two big categories, as follows:

1. Improving collaboration to **optimize existing business processes**: The changes required to these processes are minor, the risks are therefore small, and the benefits, though potentially significant, are incremental.
2. Using improved collaboration capabilities to enable a **new generation of dramatically restructured business processes**: These benefits involve more risk, along with the potential of more dramatic reward. The idea is produce next-generation processes designed from the start to leverage collaboration between team-mates, across team boundaries, and across enterprise boundaries. Since this involves a more disruptive change, this wave of collaboration-enablement involves both a bit more risk and potentially also more dramatic benefits. The techniques involved are maturing, but still somewhat experimental.

The two uses of collaboration described above are not mutually exclusive: The first is often pre-requisite to the second, though it doesn't inevitably lead there. Most collaboration-initiative roadmaps will involve some combination of the two.

Extending the scope of enterprise collaboration beyond your own organization's workforce – meaning collaboration between enterprises, or with consumers working outside of any enterprise infrastructure - presents special challenges related to available infrastructure, privacy and security, and

data interoperability. But they also offer the potential for dramatic improvements for strengthening relationships across the enterprise boundaries.

Cross-enterprise collaboration is particularly important in an age where modern operating models often call for offloading more functions to partners and suppliers: doing so brings advantages, but can also reduce the flexibility, coordination and richness of communication across the extended enterprise; effective cross-enterprise collaboration can help restore the coordination and communication needed for the multi-enterprise operation to regain the agility of the more monolithic organization. Using collaboration tools effectively with customers can also deepen relationships, leading to improved retention, increased cross-selling and improved satisfaction.

Consider, for example, the challenge of explaining a complex concept during customer contact calls. New collaboration capabilities, such as the ability to share a presentation via a technology like Webex (which can accessed with a Web browser on a broad range of devices) can make a big difference on the ability of the customer contact representative to achieve common understanding with the customer.

The table on the next page organizes some of the most common ways we see clients work to improve processes with collaboration technology:

Common Ways That Effective Collaboration Impacts Processes

Broad Category	Process improvement goal	Description
1. Improving quality and efficiency of existing processes	Orchestrating high-performance teams	<ul style="list-style-type: none"> How can we help teams of people working together on joint processes and work products, share ideas, stay synchronized, and bring together diverse skills and perspectives to produce high quality output with as little time and cost as possible? How can we make distributed teams as effective – or even <i>more effective</i> – than traditional co-located teams?
	Maximizing re-use of assets and sharing of knowledge	<ul style="list-style-type: none"> How can an enterprise maximize the sharing of knowledge and lessons learned, reducing wasted effort by increase re-use, turning the enterprise into a high-powered collective intelligence.
	Driving best-practice adoption throughout the enterprise	<ul style="list-style-type: none"> How can we shape the way teams work, to support best practices in a way that effectively spreads them throughout the organization?
2. Enabling next-generation processes	Supporting rich cross-enterprise collaboration	<ul style="list-style-type: none"> How can we make collaborative activities that cross enterprise boundaries work as smoothly and flexibly as the processes that are contained within the boundaries of a single enterprise.
	Supporting collaboration with the retail customer	<ul style="list-style-type: none"> How can we support collaboration between customer contact employees and the retail customer, who is not supported by an enterprise infrastructure or enterprise-level software tools, but does increasingly have access to sophisticated consumer-level technologies that can support collaboration.
	Enabling the next generation agile enterprise	<ul style="list-style-type: none"> How can we support the fluid formation of effective ad-hoc teams, so that the best available people are always able to work together work together effectively on the organization's highest priorities?

ISSUE THREE: Collaboration activities needed

The process improvement goals identified above can be boiled down to three main types of collaboration functions. They are 1) coordination

and synchronization of joint activity, 2) knowledge discovery and reuse, and 3) synchronous and asynchronous discussion. These main functions are carried out through a set of more specific collaboration activities, the most common of which are outlined in the table below:

Collaboration Activities Grouped by Function

Collaboration Function	Collaboration Activity
Coordination and synchronization of joint activity	Delegation of work and status sharing
	Collaborative development of joint work products
	Establishing common understanding of a process or plan (people, process, work product structure)
Knowledge discovery and reuse	Expertise finding
	Knowledge asset finding
Synchronous and asynchronous discussion	Synchronous discussion <ul style="list-style-type: none"> • high stakes decision making • brainstorming • day to day team coordination • impromptu sharing / meeting • customer contact
	Asynchronous communication <ul style="list-style-type: none"> • threaded group discussions • coordinated announcements • digital water cooler

ISSUE FOUR: Collaboration roadblocks anticipated

While effective collaboration brings major payoffs, it's only fair to acknowledge that that collaborating can also be a pain! Every form of collaboration involves overhead, and that overhead can

sometimes be significant. Collaborative technologies are important because collaboration isn't easy. The obstacles to effective collaboration come in several forms. There are communication costs; the cost of having to negotiate a common process and stay synchronized; the cost of learning; and using the collaboration technology

Some common collaboration roadblocks

Challenge	Description
Overhead	<p>One group of reasons that users may not be collaborating now is the overhead of working with someone else can be significant. This has always been true. Collaborating typically requires coordinating schedules, and establishing a common context.</p> <p>By lowering the time and effort costs, collaborative technologies can help alleviate this issue.</p>
Incentive and credit-assignment	<p>Some forms of collaboration suffer from management's focus on individual performance and measurable objectives. Existing metrics and incentive schemes do not do enough to recognize employees for the act of sharing expertise and work on projects which are collaborative efforts.</p> <p>A successful collaboration roll-out needs to take this into account and make changes where needed to metrics and incentives. Adding instrumentation to processes and collaboration tools can also be an important part of the puzzle, since you need to track behaviors in order to include them in metrics.</p>
Global Distribution and remote work	<p>Companies are increasingly becoming international organizations due to growth and need. Additionally, with new emphases on cost-savings and work-life balance many employees are working from home. As team-mates work in different offices, time zones and countries the sort of simple collaboration like talking in the halls or checking in become very difficult.</p>

Challenges to adoption of collaboration technologies

Collaboration technologies exist to support the collaboration activities, and to help overcome the roadblocks to collaboration. However, the technologies themselves often suffer from technology-adoption roadblocks. Challenges with driving adoption of collaboration tools have been acknowledged for quite some time.⁸ One reason adoption can be challenging is that although effective collaboration has the important benefits we've discussed, participating is not without cost and risk to the participants, and as such the decision to adopt collaboration tools is not a no-brainer. Collaboration tools can be challenging to learn, and it can be difficult to access. Another problem with collaboration is that any extra effort it takes – for instance, to coordinate with a colleague, or to search for assets to re-use – generally comes first, with the benefit coming later. People are notoriously resistant to making choices that involve paying up front for benefit that will (probably) accrue later. Another problem is that collaboration sometimes benefits a different person than the one who must do the work.

There are many potential challenges to adoption of collaboration technologies, but most difficulties we see can be understood in terms of a standard four-factor technology adoption⁹: 1) Performance Expectancy, 2) Effort expectancy, 3) Social Influence, and 4) Facilitating Conditions. The table below explains what these general technology-adoption factors are, maps them to the collaboration space, and introduces approaches to addressing the factors in order to more effectively drive adoption of collaboration technology.

Collaboration Adoption Factors

Technology Application to Collaboration

Performance Expectancy

- **Problem description:**
 - When first presented with collaboration technology users may not understand the performance expectancy: how collaboration tools will help them collaborate better or how they will receive credit for doing so.
- **Addressing the problem:**
 - The organization and its leadership to make sure that the purpose and business impact of collaboration, and the role of tools in making collaboration more effective is fully explained.
 - In addition, the tools should be instrumented so that contributions using them can be tracked, and incentives must be aligned so that users receive credit where credit is due.

Effort Expectancy

- **Problem description:**
 - Effort expectancy is about the amount of effort end users *perceive* the technology to require (whether the perception is correct or not).
 - The collaboration tools and platforms often have high effort expectancy because they require learning new interfaces, and because using them they often involve switching contexts away from the tool being used to do the main job into one or more tools to collaborate.
 - In addition to the technology-specific challenges, the interpersonal overhead involved in many forms of collaboration also contributes to high effort expectancy.
 - Effort expectancy plays an especially large role in adoption of collaboration technologies because the benefits are less direct than with some other technologies. Direct effort cost looms large in users mind when the benefit is often indirect or longer term.
- **Addressing the problem:**
 - We see four big levers for addressing the effort expectancy related to collaboration technology
 1. Design for usability: Easier to use may often be more important than pushing for every last drop of functionality
 2. Provide high quality training and messaging to make it easy to understand and use the tools
 3. Embedding collaboration technology directly in the tools users already work with, rather than requiring going to a separate tool or website.
 4. Automate all possible aspects of the collaboration process, to reduce collaboration overhead.

Social Influence

- **Problem description:**
 - User's perception of what one's peers and leaders think about the use of a technology is a factor that influences adoption of most end-user technologies. It is an especially important factor with collaboration and social technologies because the value of the technology is directly dependent on who else is using it, and usage is inherently visible to collaborators, often to leadership.
- **Addressing the problem:**
 - One avenue to making sure that social influence factors run in the right direction – to encourage rather than discourage effective collaboration – are as simple as getting early, energetic participation from influencers (including the organization's leaders) and making that influencer-buy-in as visible as possible. Another avenue can involve creating "badges" and scores to incent participation and make it visible.

Facilitating Conditions

- **Problem description:**
 - Technologies require facilitating conditions, such as a reliable network, human support, or even physical environment. Technologies that are highly desirable in theory, can be unpleasant or unusable when the right facilitating conditions are not in place. As a simple example, it is difficult to use a phone on an active construction site where there is no quiet space to talk.
 - Some collaboration technologies place significant demands on the infrastructure which provides facilitating conditions – the network, the systems and the support personnel - especially when it crosses organizational and even enterprise boundaries.
 - One other aspect of facilitating conditions for collaboration is supporting users in the context where they actually do their work. For office workers, this may mean embedding collaboration in the tools that they use. For workforces who move around while doing their jobs, it may mean delivering collaboration technologies on mobile devices.
- **Addressing the problem:**
 - Providing best facilitating conditions would generally be easy if resources were unlimited. With funds, you can ensure that bandwidth and quality of service are high enough, firewalls are configured to permit traffic to pass appropriately, and disparate systems are made interoperate to allow for seamless collaboration in which the infrastructure does not get in the way.
 - In a world of finite resources, providing best possible facilitating conditions for least possible cost requires careful analysis of the processes that collaboration is meant to support, and to align investment with providing the facilitating conditions that really matter for that process.

ISSUE FIVE: Collaboration solutions required

Mapping collaboration technology toolkit to identified needs

The collaboration functions and activities described above are supported by a set of collaboration tools. Each vendor offers a different set of tools, dividing up the overall space in slightly different ways, and covering different portions. However, there is a rough shape to the landscape, which can be described independent of the specific vendors. This level of description can be a helpful one for mapping activities to technology types, and then eventually specific vendor tools.

The table below organizes the technology types in terms of the activities and collaboration functions they support.

In the appendix, we illustrate the use of technologies listed above in some specific applications.

Collaboration technologies organized by activity and function

Collaboration Function	Collaboration Activity	Supporting Collaboration
Coordination and synchronization of joint activity	Delegation of work and status sharing	<ul style="list-style-type: none"> • Task management systems • Activity feeds for projects or individual status updates • Project planning programs
	Collaborative development of joint work products	<ul style="list-style-type: none"> • Document storage • Real-time document sharing • Version control
	Establishing common understanding of a process or plan (people, process, work product structure)	<ul style="list-style-type: none"> • Shared team wikis and calendars • Shared process models
Knowledge discovery and reuse	Expertise finding	<ul style="list-style-type: none"> • Profile management system • Community discussion boards • Social graph
	Knowledge asset finding	<ul style="list-style-type: none"> • Enterprise search • Source code repositories • Document repositories • Document tagging
Synchronous and asynchronous discussion	Synchronous communication <ul style="list-style-type: none"> • high stakes decision making • brainstorming • day to day team coordination • impromptu sharing / meeting • customer contact 	<ul style="list-style-type: none"> • Chat and presence • Desktop video chat • High Definition Video Conferencing • Unified Telephony and VOIP • Screen sharing • Digital whiteboards • Web conferencing
	Asynchronous communication <ul style="list-style-type: none"> • threaded group discussions • coordinated announcements • digital water cooler 	<ul style="list-style-type: none"> • Individual and community Blogs • Open enterprise forums • Email • Activity feeds for employee status updates and questions

Vendor technologies supporting the collaboration repertoire

The enterprise collaboration technology vendor landscape includes a lot of players with a fairly broad array of products. It is also fast moving, meaning that anything specific we say about the dynamics of the vendor space may well have changed by the time you read this. But for the moment, it seems that while many of the vendors have strength in specific market or technology niches, there are really three players with broad collaboration suites that command significant portions of the market - Microsoft, Cisco, and IBM/Lotus:

- Cisco is particularly strong on the lower end of the stack, with market-leading technology for providing collaboration infra-structure. They are also leaders in the high-end video-conferencing space. With the recent acquisition of Tandberg, they have now moved into leadership in the mid-tier as well.
- Microsoft's SharePoint suite commands a dominant market share in the knowledge-sharing / team coordination platform space. Tight integrations with Windows and MS Office help strengthen those offerings, while plugins such as Newsgator offer expanded capabilities such as activity feeds and expanded profiles.
- IBM/Lotus is also a comprehensive application-centric suite, and is best suited for existing Lotus users given the connectors and interactions with things like Lotus Notes and Lotus Quickr. Lotus is also one of the earliest innovators in the social parts of collaboration, with Lotus Connect being the furthest developed corporate social network.

In addition to the major collaboration vendors there are also traditional document management tools such as EMC's Documentum which provide, either on their own or in addition to team sites like SharePoint, the ability to view and search for documents at a more advanced. When combined with social functions and expert search capabilities, knowledge finding becomes incredibly easy.

Beyond these three big players, there are a large number of smaller players with point solutions, including some that specialize in emerging niches such as mobile collaboration technologies. Also emerging is a set of lighter-weight offerings including a number of very inexpensive (or even free) cloud-based tools. This latter group generally is not considered as serious enterprise-wide solutions: They tend to target the small-to-medium-sized businesses, though we do see instances where

individual groups within an enterprise are sometimes turning to these vendors on an ad-hoc basis for specialized needs, since they are inexpensive and easy to provision on a self-service basis.

One trend worth noting: We are seeing cloud/Software-As-A-Service vendors such as Google and Salesforce emerging as potentially important players in collaboration. Salesforce's Chatter collaboration technology integrates closely with the SaaS business-process platform, and the success of that collaboration tool will probably closely track the success of Salesforce's platform in general. Google's web-based suite of office tools are deeply collaborative, since they allow for easy sharing and co-authoring of documents stored online, created and edited with Google's cloud-based tools.

For those interested in a bit more details on the current vendor offerings, see the annex to this point of view (a separate document) entitled, *Collaboration Technologies Vendor Overview*.

Enabling and supporting the solution

Enabling the needed collaboration activities involves making basic technology tools identified available to target users along with required infrastructure, such as network of sufficient bandwidth, servers with appropriate storage, etc.

Supporting collaboration involves more than merely providing the required technology. It means marketing the available collaboration technologies and training target users on both how they work, and how they can/should be used to achieve the targeted business priorities. A few points:

- It's important to provide messaging that is clear about the targeted process improvements as much (or more) than focusing on explaining the new tools that are available.
- It's crucial to establish and communicate buy-in to the business objectives, the tools, and how they relate to each other at all levels of the organization. Reaching out only to potential users is unlikely to work if you are asking them to do something extra, beyond the things that already keep them busy all day, and you do not have strong buy-in from their management.

It's important to connect the dots between the tools, the process improvements they enable, and the performance metrics that employees and organizations are assessed against.

Advanced steps to further improve collaboration solutions

We've talked about collaboration technology at several levels: the impacts collaboration can have; the kinds of processes in which it makes those impacts; the collaboration activities that provide the impact; the technologies that support the needed activities; and the challenges involved in driving adoption of collaborative behavior and collaboration technology. These are core the conceptual building blocks needed to analyze and develop effective collaboration solutions. Getting them right, and selecting and supporting technologies that align with process needs, goes a long way to driving effective collaboration.

However, given how difficult it is to collaborate effectively, there's always room to do more to make it easier; even successful completion of these basic steps leaves a significant amount of the insight, initiative, and effort required for effective collaboration up to the end users. As we outlined in the initial discussion of the six work streams to driving effective collaboration, there are advanced and emerging technology and integration approaches that can further reduce barriers to effective collaboration. Organizations that want to lead in this area will want to explore using these advanced techniques and technologies to embed, provide intelligent integration, and support as much automation of collaboration as possible.

With this context now established, let's return to the six work streams for shaping process-oriented collaboration that we overviewed earlier, and examine them in a bit more detail to walk through the effort involved in weaving collaboration solutions that put these conceptual building blocks together to support effective collaboration.

Embedding required collaboration technologies

Embedding involves reducing the overhead to collaboration by inserting collaboration tools and support directly into the applications and processes where they are meant to be used. There are really two distinct forms of embedding:

- **Interface integration** involves integrating the front end of collaboration tools into the business applications that employees use to execute relevant business functions, so that they do not

have to leave those applications to access the collaboration tools at targeted points of need. For example, picture a customer-contact system that has instant messaging tool for finding relevant expert embedded into it to make it very natural to bring the most relevant available expert into the conversation with the customer. Or picture a 'share with coauthors' button within a word processor that allows employees to get input on some aspect of a work-product from coauthors without leaving the word processor.

- **Process integration** involves modifying the process description (or plan template) and supporting materials to explicitly build collaboration steps into the process. Collaboration takes time and effort that often needs to be explicitly supported and accounted for.

Deeply integrating collaboration technologies with underlying business applications

We define deep integration of collaboration into business processes as going beyond the front-end and process integration to include back-end integration of collaboration tools, such that data is shared between business applications and collaboration tools. For instance, this allows for the queries used to search the enterprise for experts to be composed using data drawn from the business applications and/or other collaboration tools. We've found it helpful to classify this data integration into three main groups:

- **Basic integration:** for collaboration within the enterprise.
- **Semantic integration:** within the enterprise, in which the messages passed between applications, is encoded in standardized representation, so that each can actually interpret what they get from the other.
- **Cross-enterprise interoperation:** for collaboration between different enterprises, which often involves a more complex data translation issues to allow each partner to make sense of data shared by the other.

Automating collaboration assistance

Automating collaboration involves developing smart technology that lowers the overhead of collaborating through the use of intelligent collaboration agents which proactively identify collaboration opportunities based on advanced analytics, and then handle much of the routinized aspects of collaboration without user effort.

For example, picture an automated assistant that runs in the background, analyzes the text of a work-product you're working on, determines that it's

similar in content to a section in another work product, written by someone else in the enterprise, then handles the basic messaging necessary to request assistance from that person. The result is that people are connected with those who can provide expertise while minimizing the overhead required of either of the collaborators.

We believe that intelligent collaboration assistants are the future. The intelligent technology needed to support the full version of this vision is still emerging, but forward looking companies will want to take small steps in this direction now.

Summary

Effective collaboration at all levels is growing increasingly critical to the success of the modern enterprise - not just collaboration between teammates, but also across teams and departments, and even crossing enterprise boundaries. As we've discussed, merely throwing technology at the collaboration problem is a mistake. *But giving up on driving collaboration is a much bigger mistake.* The imperative for enterprise leaders is to bring desired collaboration-driven business changes into sharp focus, to identify the roadblocks which make the needed collaboration challenging, and to develop a plan to drive the collaboration which will achieve the targeted changes. The plan needs to incorporate both the technology-based, and non-technology-based components that together address the desired changes *and* mitigate the collaboration roadblocks and technology-adoption hurdles discussed above.

The complexity of today's products and services, and the market pressure to continually improve both efficiency and quality, are among the issues that demand the ability to communicate, coordinate, and collaborate effortlessly across the entire extended enterprise.

At the same time, the ability to collaborate effectively faces increased challenges due to the increased size, and more complex structure of the modern enterprise: For example, colleagues located across the world are more difficult to collaborate with than colleagues located across the hall. Fortunately, a range of collaboration technologies has matured to

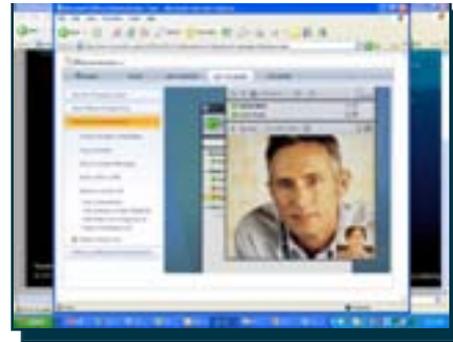
the point where they can make a big impact on both operational efficiency, and the ability to drive innovation. Several vendors offer powerful toolkits that can be used to facilitate various forms of collaboration.

Experience has shown that simply making a good collaboration toolkit available to your workforce does *not* usually suffice to drive dramatic benefits from high-value collaboration, but that a systematic approach to crafting collaboration solutions that align to targeted processes can make the underlying technology much more effective. In this Point of View we have described a sequence of 5 key questions to ask in order to shape an effective collaboration technology initiative, and have outlined the key work streams to pursue as you execute that initiative, weaving collaboration technologies – as well as the key non-technological ingredients of effective collaboration – into a targeted collaboration solution that will effect specific process change, and thereby yield valuable business results.

Appendix: Examples of collaboration technologies in action

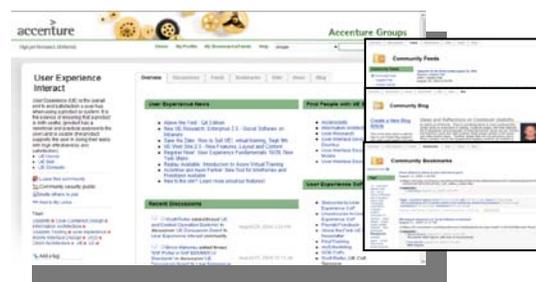
The examples that follow are sample illustrations of how the tools now available on the market can be used to achieve specific, targeted process-improvement.

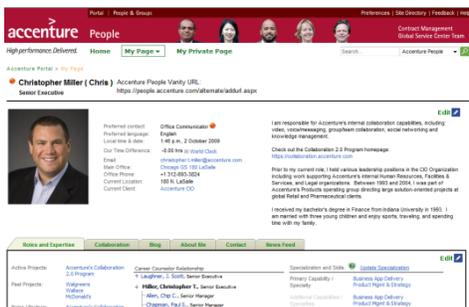
Connecting employees around the world: For companies with employees working from different locations – whether it’s different locations, home offices or even half way around the world – chat and presence applications enable the office environment online. Without presence, the process of getting a hold of remote colleagues often involves phone tag and disruptive interruptions to see if they are available, all of which increases the overhead of collaborating, making it less likely to happen. By using the presence indicators, employees can detect if their coworkers are free to chat and once they are talking, users can easily escalate to a more serious conversation via voice or video. Many of these applications, like Microsoft Office Communicator and Lotus SameTime connect to pre-existing sites and applications to make the opportunity to connect as ubiquitous as possible.



Enabling high-quality meetings across multiple locations: For many organizations, managers and executives have to be at meetings in-person due to the “high touch” needs and the important decisions that happen at these meetings. Without being able to fully see and hear the other participants – whether they are fellow executives, business partners or clients – subtle cues and visual signals may be missed, not to mention ideas less convincing. Yet permanent colocation is not a reality and travel is expensive. The newest offerings for high-definition video conferencing solve these problems by providing near-perfect audio, video and content sharing at a fraction of the price of traveling.

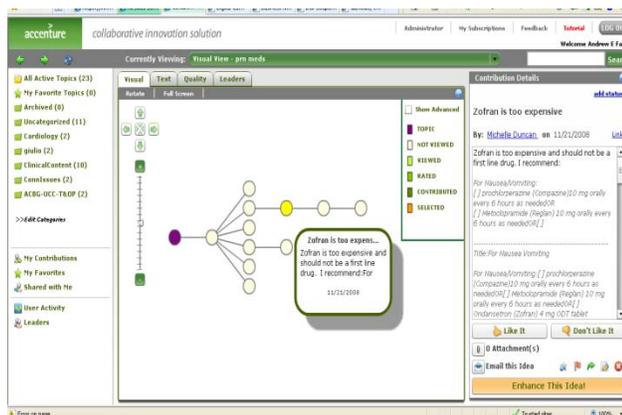
Connecting experts across silos: For enterprises that are organized into vertical streams, there is definite need for cross-group communications and communities in order to make sure the company is working together as a whole and not fracturing itself into isolated silos. Community software that provides features such as threaded discussions, shared content, open admittance and group announcements can help to bridge these verticals no matter the distance or organization.



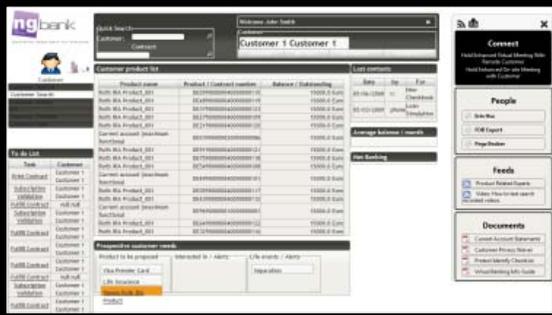
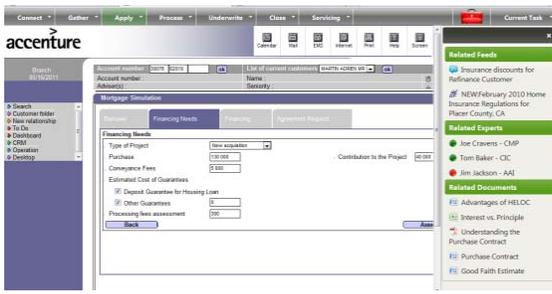


Finding expertise now: For many organizations, no matter their size, finding the right expert can be difficult. Employees usually ask their small immediate network – prior associates and hall mates – which frequently leaves out most of the enterprise. Modern profiles allow experts to share their interests, previous experience and areas of expertise – all while allowing employees to search using the same criteria. Advanced profiles can pull this information automatically from contributions and show not only the experts, but also their availability and who you may know in common to make introductions.

Finding new ideas, new voices: It can be difficult, especially for large organizations to find **innovation and new ideas** beyond those who are most frequently consulted, if at all. Without new contributions, innovation may stagnate. Enterprise wide discussion forums and wikis can help share the knowledge and identify the experts by opening up innovation processes to get everyone involved. The Accenture Innovation Grapevine helps organizations achieve innovation using a highly customized forum interface focused on a mass innovation/collaboration process where the quality of conversation is judged by peers rather than preexisting relationships.



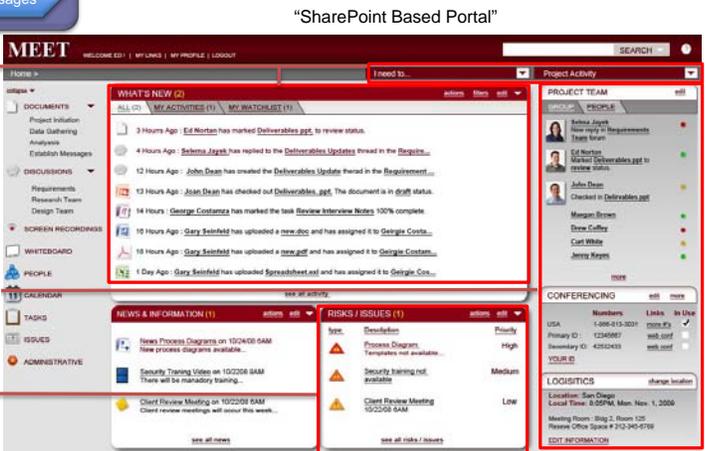
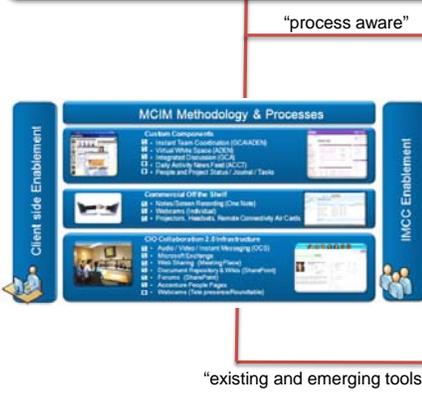
Stay in the loop anywhere, anytime: For many employees, life no longer just happens in the office but also in the car, on the plane and all the time. As companies increasingly move to having locations and teams around the globe, businesses will increasingly operate 24-7 and in a variety of locations. Using an enterprise activity feed allows users to stay in the loop as well as reach out to experts and colleagues no matter their working hours or working location. Salesforce's Chatter Mobile allows users to communicate on the go, posting comments and questions as well as checking the activity feed of their colleagues. Salesforce's Chatter client works on tablets such as the iPad and on a full selection of smart phone devices.



Bringing it all together in a process-oriented solution: Regardless of how many collaboration tools have been implemented in an organization, achieving business success requires integration of those collaboration tools into a specific business process or methodology and existing applications. Accenture's Collaborative Process Toolkit provides a light UI and the connecting services to embed collaboration tools into core business processes and applications.

The centerpiece of the solution is an embedded Collaboration Assistant which recommends appropriate collaboration actions, experts, feeds, and knowledge based on the current step in the workflow and the information entered into the application. The Assistant brings together existing applications, business workflows, and collaboration tools. Several versions of ACPT have been created for specific industries (Insurance, Retail Banking, Healthcare) and functions (team collaboration).

Ongoing research within Accenture Technology Labs is aimed at extending this offering by adding increasing levels of intelligence to the collaboration assistant. The next generation assistant will include advanced technology that leverages models of the people, processes, and work products involved in a collaboration to automate updates sent to team-mates, and will provide enhanced awareness about relevant experts and assets, and about progress against plan, based on deeper analyses of the activity collaborators perform in the relevant business applications



"Embedded Tools like PeoplePages and MeetingPlace"

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End Notes

- ¹ Evan Rosen refers to this as “The Myth of the Lone Cowboy” in Rosen, E. (2007) *The Culture of Collaboration: Maximizing Time, Talent and Tools to Create Value in the Global Economy*. Red Ape Publishing, San Francisco. The metaphor seems to suggest this is an especially American phenomenon, but it seems to have spread, to a significant extent, throughout the business world.
- ² Hansen, M.T. (2009) *Collaboration: How Leaders Avoid the Traps, Create Unity, and Reap Big Results*. Harvard Business Press, Boston
- ³ CIO Magazine 2010 State of the CIO Survey
- ⁴ Source: North American Most Admired Knowledge Enterprises - Teleos
- ⁵ “Accenture Technology Vision 2011 – The Technology Waves That Are Reshaping the Business Landscape.” (Available [online](#) at Accenture.com).
- ⁶ Discussed in the Hansen book, and also Accenture Cisco Business Group case studies available [online](#) at acbg.com.
- ⁷ 2011 Cisco/IBSG Wealth Management Study.
- ⁸ Grudin, Jonathan, “Groupware and Social Dynamics: Eight Challenges for Developers.” January 1994, *Communications of the ACM*
- ⁹ Venkatesh, V., Morris, M., Davis, G., Davis, F. (2003) User acceptance of information technology: toward a unified view. *MIS Quarterly*, (27)3, pp. 425-478.

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