
Trends in Collaboration Practices and Technology

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Abstract

This paper presents an approach to determining where and how improved collaboration will add value to an organisation. This is done by breaking up collaboration into manageable components around which requirements can be gathered. Secondly Social Network Analysis (SNA) and mapping of Value Networks is introduced to help organisations better understand how employees currently interact with a view to improving collaboration. This, along with an appreciation of an organisation's collaborative climate, will provide key input to identifying requirements for collaboration. It will also help organisations understand how their current technologies support these requirements as well as preparing them for the coming changes in technology.

INTRODUCTION

Traditionally, when we have worked together we have done it because we worked in the same office, on the same level in a building etc.. Working together meant being physically co-located. For many organizations this is still true. Working together and being together contain two important elements. Working together implies that we are collaborating in the 'same place', and being together that we collaborate at the 'same time'.

Globalisation is changing collaboration

In recent years increased globalisation has led to a change in the traditional way of collaborating. Parallel innovations in technology and communication channels have dramatically changed the dependence on co-location. Out of this arose the practice of 'virtual collaboration', where we work together without actually being together. The dynamics of virtual collaboration are very different to those of traditional collaboration, simply because of the lack of direct physical interaction.

Virtual collaboration allows people to work together across locations and multiple time zones. Outsourcing of many IT areas (e.g. software development and helpdesks), to countries like India is further enhancing this trend.

Technology is changing collaboration

It is increasingly being recognized that changes in technology are making it feasible to bring work to people instead of bringing people to work. Why would we want to waste time and effort bringing people together if physical presence is not required? Wouldn't it be smarter to transfer everything that is needed to do the job to the person? We certainly have the technology to do it. However, we are now realizing that there are both sociological and technical issues still to be resolved. In addition to the new opportunities technology brings, organisations are being presented with a plethora of collaboration technologies which now, more than ever, becoming embedded in Enterprise Portals, Enterprise Resource Planning systems and Operating Systems.

Inter-organisational activities are changing collaboration

The last key development that has changed the collaboration landscape is the increased need for collaboration with people outside the traditional boundaries of the organisation. For example, we no longer have to visit a trading partner physically to get a briefing on the latest product release. We can now receive the briefing over the Internet, which reduces travel costs, and increases the opportunity for more people to attend.

In a supply chain the manufacturer can now more effectively work with a retailer to determine future demand, etc. In fact market analyst Gartner is claiming that "...preparing the enterprise and its trading partners for collaboration on the infrastructure, organizational and project management fronts will be critical to success." (Gartner 2002).

So, it has become clear that collaboration is no longer just an activity that happens between individuals and teams within an organization. It is increasingly something that is done with people outside the organisational boundaries.

In other words - it's *NETWORKING OR NOT WORKING*.

In this paper we will be providing an approach for effectively analyzing your organisation's collaboration requirements and putting in place tools and techniques for maximizing the benefits you can achieve. The framework presented in the next section identifies the key elements used to assess collaboration requirements. Two example case studies are provided to illustrate business process focused collaboration in action. Finally, a section on technology trends is included to assist organizations develop strategies to manage the plethora of collaboration technologies now becoming available on the market. Essentially strategies are needed to manage the conflict between enterprise wide and business process specific needs.

INTRODUCING A FRAMEWORK FOR COLLABORATION

Research carried out by the Working Council of Chief Information Officers (WCCIO 2002), suggests two distinct types of collaboration are emerging. The first type is *Communities of Practice*, which is oriented towards collaboration transcending existing business processes and functional areas. The second type is *Business Process Collaboration*, which focuses on greater efficiencies within existing business processes.

The focus of this paper is on how organisations can benefit from improving collaboration in support of core business processes. The diagram below highlights a proposed framework for collaboration, and also serves as a graphical representation of the following sections.

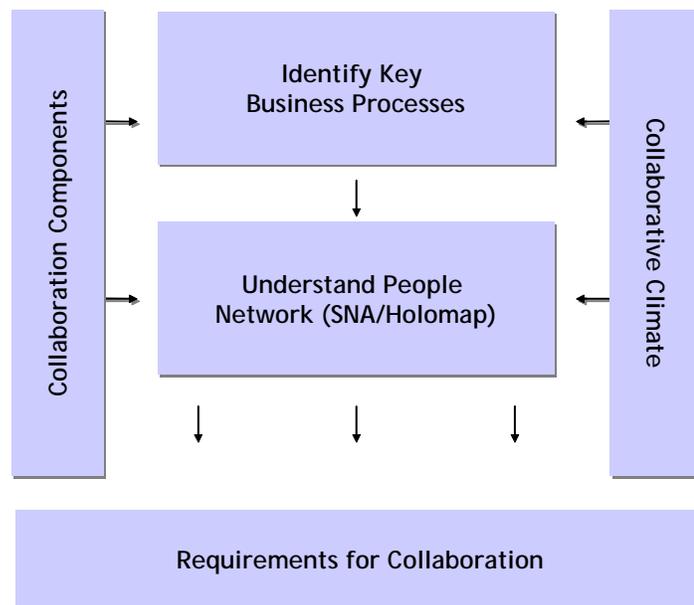


Figure 1 - Framework for Collaboration

Collaborative Components breaks collaboration up into manageable components which can be used to drive the gathering of collaboration requirements. The focus is on support of people interactions such as how to find a person, how to schedule a meeting etc.

Collaborative Climate will provide an overview of key findings in a recent study which are important to understand if any collaboration initiative is to be well received in an organisation.

Armed with an understanding of what collaboration is, and how open people are to it, it is now possible to *Identify Key Business Processes* and *Understand People Networks (SNA/Holomap)* to find out where improved collaboration will lead to increased business performance.

Based on this preparatory work an organisation is in a position to clearly lay out its *Requirements for Collaboration*.

COLLABORATION COMPONENTS

Collaboration, as a general concept, is not easy to understand, so it is necessary to break it up into smaller manageable components. What actually triggers collaboration and how it is done varies from person to person depending on things such as mutual trust, timing, distance etc. However, in general, a series of components comprise the collaboration process.

Finding People

The first part of collaboration is to find the person that you want to collaborate with. So how do you do that? Within an organisation the company directory is one of the most used tools for looking up names, addresses, phone numbers or email addresses.

However, if you don't know the name of a person, but only the role or the topic area, a traditional directory is of little use. Many organisations have therefore launched 'Yellow Pages' projects to address such issues. Issues related to finding people often revolve around a lack of access to the company directory for e.g. sales people or other highly mobile employees. When they are out in the field a simple task like looking up a phone number suddenly becomes a key barrier for effective collaboration. Other issues relate to the lack of consistency in updating entries in the corporate directory. Often staff will need to rely on referrals from colleagues to identify appropriate staff to engage with. In some situations this might be the preferred mode of operation as typically referrals also include a qualification of the contact e.g. are they actually open to collaboration or contact?

Making contact

If you know who you need to collaborate with the next step would most likely be to make contact. Even though this sounds a trivial task, in reality it is not. A simple example will demonstrate this point. You need to get in contact with your colleague John within an hour to be able to respond to a customer query. Not responding in time will upset the customer. Armed with John's number you place the important call, but John doesn't answer the phone. Now what? By fully understanding the problems people experience in making contact with each other – or with partners/clients - you can address the key issues. For example this could be done by ensuring that proper voicemail messages are set up, automated out-of-office replies are sent, electronic calendars are updated etc.

Scheduling Meetings

This activity appears, like the previous, quite trivial. However, scheduling meetings are many peoples' worst nightmare, and often valuable time is wasted finding out who is available and when. Combine this with multiple time zones and calendaring systems and this activity becomes even harder. Even when all the participants are lined up, finding suitable rooms and supporting tools like telephone-conference phones, overhead projectors etc. just adds to the frustration. Having in place effective processes for booking rooms and using the email software's invitation functionality optimally can address some of these issues. It can also take the stress out of managing logistics and reduce the need for additional administrative staff typically used for this task.

Discuss

This step is mainly focused on virtual teams where traditional face-to-face discussions are not possible. Working in multiple time zones, can prevent or dramatically limit the window of opportunity for real time conversations. In some instances the use of discussion boards can address this issue, and agreed protocols need to be in place to ensure a smooth running telephone conference for employees working in roughly same time zones.

Jointly Develop

Another component in collaboration is the joint development of, for instance, a document. Traditionally email has been the preferred tool of use to distribute drafts for comments, but web-conferencing tools have made it possible for multiple persons to work on the same document – at the same time – even though they are not co-located¹. Many organisations have deployed collaboration software, often included in enterprise portal offerings, without understanding how such tools will improve collaboration, and without understanding where

¹ Closely related to 'Jointly develop' is the area of information management which is not the topic for this paper. Information Management deals with document lifecycle issues such as access control, version control retention, archiving and deletion

improved collaboration will generate most value. For example, if an organisation has experienced problems with identifying relevant subject matter experts to respond to customer queries, the setting up of a team collaboration tools is not necessarily the best solution to address this.

By understanding each of the collaboration components, one can ensure that each one is adequately addressed, providing a much higher chance of success.

ASSESSING THE COLLABORATIVE CLIMATE

Since 2000 Drs. Karl Sveiby and Roland Simons have researched (Sveiby and Simmons 2002) organisational ability and willingness to collaborate. This is an area they call the 'collaborative climate'. They found that "the appreciation of collaborative climate depends on the vantage point of the person".

In their study they analysed 8,200 responses (mostly Australian) from people working in both the private (63%) and public sector (37%). The survey looked at 4 elements making up the collaborative climate:

- Organisational Culture
- Immediate Supervisor
- Employee Attitude
- Work Group Support

For each element the respondents were asked to rate the extent to which they agreed with a number of statements. For instance, under Organisational Culture one of the statements was 'Open communication is characteristic of the Department as a whole', and respondents could rate the extent to which this statement was true for their own organisation.

A number of interesting conclusions were drawn based on the responses.

Collaboration improves with age

It is a myth that older employees are not interested in collaborating. The survey data supported the hypothesis that with age comes more experience in sharing knowledge via access to larger networks and easier access to knowledgeable colleagues. So the older respondents actually regarded the collaborative climate more favorable than other groups.

Employees with 3-5 years in the job are more cynical about collaboration

The new employee thinks highly of the collaborative climate, but it doesn't last for long. 3-5 years in to the job the new employee becomes more cynical. It is suggested that it takes a lot longer for new employees to become truly effective than previously thought, and that organisations need to put more effort into helping new employees get past the cynical period.

More experience leads to a higher appreciation of collaboration

The study found that employee attitude peaks after 15 years. Reaching this plateau appears to be quite normal and is probably something organisations should expect to happen. Realising that it will most likely happen, sooner or later, will better position organisations to design appropriate interventions rather than being surprised by it.

Educated people appreciate collaboration – managers don't

The better educated people are, the more favorable they regard the collaborative climate. But the data did not verify the hypothesis that progressing into managerial positions equals higher regard of the collaborative environment. So, getting acceptance from the business process owner (most likely a manager) to improve collaboration is essential.

Large organisations have a better collaborative climate

The larger the organisation is the better the collaborative climate is². It is a myth to think that smaller organisations have a better collaborative climate. This is interesting as many would have thought that employees in smaller organisations are more likely to know each other and therefore should be more willing to collaborate.

Distance is bad

As one would imagine, the more geographically distributed the workforce is, the less favorable they rate the collaborative climate. This is of a particular concern as one of the key trends today is to move work to employees, which will create an even more disparate workforce.

Private sector is better

Currently the private sector rates the collaborative climate more favorable than the public sector. Sveiby and Simmons argue that there is no reason why this should be the case as public sector employees are made up of a high number of knowledge workers. They suggest that "...there is a huge potential for improving effectiveness of knowledge work in the public sector".

Understanding what drives the Collaborative Climate is very important input to any project aimed at improving collaboration. Does your workforce consist of primarily highly educated employees? How geographically distributed are they? How long time have they been with the organisation?

These questions must be answered for the employees that are involved in process areas identified for improving collaboration. Many of the above findings should be incorporated or be considered within the organisational change management programme that should accompany any change to your organisation's collaborative environment.

IDENTIFY KEY BUSINESS PROCESSES / UNDERSTAND PEOPLE NETWORKS

It has been suggested that collaboration is "not viewed as being important except when you take it away. It is not a CEO issue until the mail system goes down, or until the document management system goes down, or until the workflow system has failed", (META 2003). So it appears collaboration - as a generic concept - is not very visible.

The lack of visibility typically stems from trying to improve collaboration without a focus. Our experience demonstrates that organisations that have a clear focus for where to improve collaboration will get the most value in return.

Why focusing on business processes?

For collaboration to provide a meaningful focus it must have an objective. We suggest that organisations should make that objective the same as the business objective, which means alignment with business processes.

² Small=50, medium=51-250, large=251+ employees

Providing such a business process focus has been described as ‘Contextual Collaboration’ by some analysts (META 2003). So, instead of addressing collaboration in broad terms, we focus on business processes where the investment will have the highest return. Virtually no business process can be carried out without some kind of collaboration. Even in fully automated environments things invariably go wrong, and humans need to work together to fix it.

One of the benefits of focusing on existing business processes is that existing metrics to monitor performance may be used, so there is no need to invent new measures which would require significant effort to both develop, monitor and report on.

So how do we determine what business processes are most likely to be targeted for collaboration improvement initiatives? Mapping out a business process flow can be a very effective way of identifying areas where collaboration can add value. However, no matter how good we are at mapping out business processes, we will only get a part of the picture right as knowledge work rarely follows a rigid path.

A process mapping exercise will identify the formal processes and the formal flows, but not the intangible flows. Intangible flows are often important trust-building informal interactions which are normally not captured in a traditional process map. They are often the flows that you would want to look at in more detail, as they can provide great potential for extracting value.

To get a more comprehensive picture of how an organisation currently collaborates, there are a couple of very effective approaches that can be made use of. One of these approaches developed was by Verna Allee and is called Holomapping (V., Allee). It clearly identifies the “informal” links representing largely undocumented “practices” that are relied on by employees. The second approach is based on Social Network Analysis (SNA), which purpose is to compare linkages between individuals, and then analyse the patterns.

Holomapping

The HoloMap™ technique is used to provide an overview of the present state in terms of a Value Network. Verna Allee defines a Value Network as ‘a web of relationships that generates tangible and intangible value through complex, dynamic exchanges between individuals, groups or organizations. Any organization or group of organizations, engaged in both tangible and intangible exchanges, can be viewed as a value network, whether private industry, government or public sector.’

This technique differs from conventional business process mapping techniques. It clearly identifies the “informal” links representing largely undocumented “practices” that are relied on by employees.

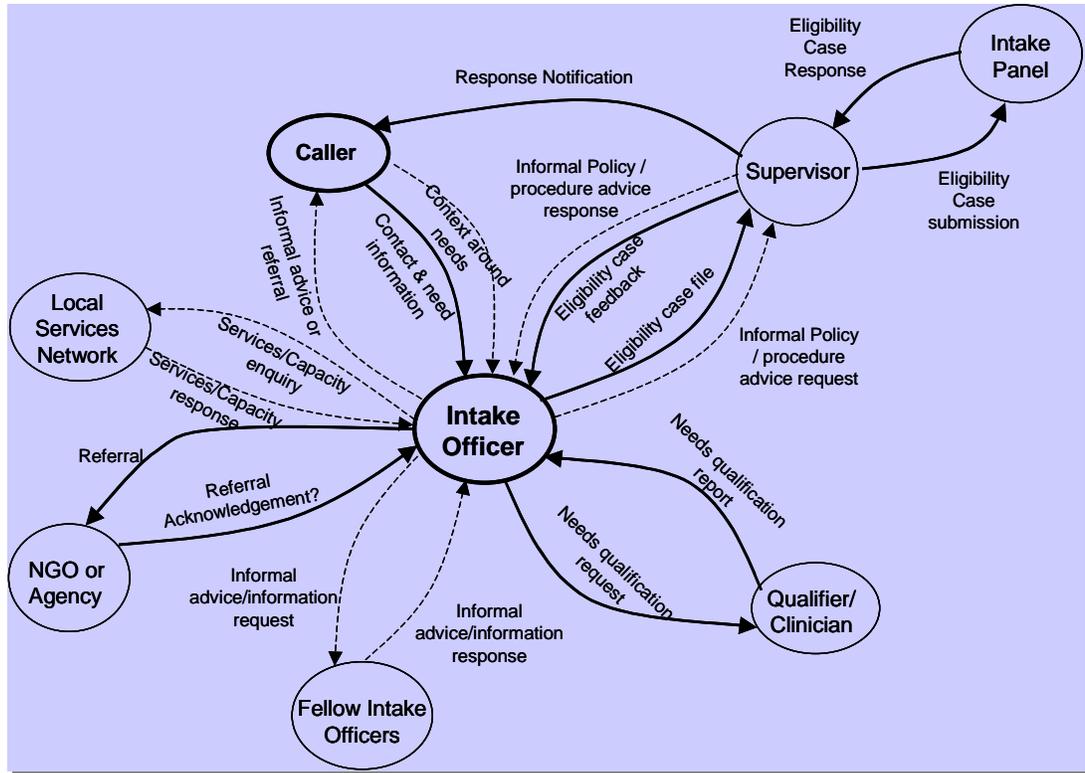


Figure 2 - Value Network Map

This map represents a Value Network of an Intake Officer (a Case Manager) collaborating with a number of people as a part of determining eligibility for a government service.

Circles on the map represent participant roles. **Firm** arrows represent formal transactions (usually evidenced by the formal paper flows). **Dotted** arrows represent the informal transactions (not normally found in documented procedures).

By looking at the map we can clearly see that the relationships between the 'Intake Officer', the 'NGO or Agency' or the 'Qualifier/Clinician' consist of formal transactions (firm arrows). These are the processes most visible to management, and provide the information required to monitor the "performance" of the organisation. Interviews with business process participants will in most cases confirm the use of the "formal flows", for example getting information from the caller, and then submitting the case to the 'Intake Panel'.

The relationship between the 'Intake Officer', a 'Fellow Intake Officers' or 'Local Services Network' is purely informal (dotted arrows). In many instances this is where people feel that real value was added, for example talking with colleagues who know unwritten previous experiences with the same caller.

A value map clearly delineates the formal processes and informal practices that collectively describe where value is generated during the execution of the business process. Traditional improvement activities are focused on improving the efficiency of the formal processes. This is done through streamlining and/or automated support and enhancing the facilitation of the informal practices. However, the benefit of a HoloMap is that it clearly demonstrates that a business process relies on more than supporting the formal process flow. It clearly shows where the intangible flows occur. These equally need to be supported by improved collaboration.

Social Network Analysis

Like holomapping, Social Network Analysis (SNA) looks to uncover the ‘unwritten’ collaborative practices used to support a business process. This method is similar to the one the police use to track relationships between criminals. The purpose of SNA is to compare individuals and their linkages, and then analyse the patterns. Use of graphical mapping tools dramatically enhances our ability to see relationships between people that were previously invisible.

SNA can be traced back to Harvard researchers in the 1930s (Scott, J, 1991) but has more recently been used to track worldwide terrorist networks such as Al Qaida (Krebs, V). Also, SNA is known to have assisted in tracking the development of the SARS outbreak in China.

The approach suggested here is to focus on a particular process area of an organisation, for example proposal development, field sales or service management, and look to identify exactly who interacted with whom in executing the process.

Computer Sciences Corporation’s (CSC) use of SNA is typically to focus the analysis around key business processes and key decision points (Lock Lee, L, 2002) within the overall organisational activities. We do this to discover the pattern of relationships supporting the process areas and look for potential gaps in collaboration.

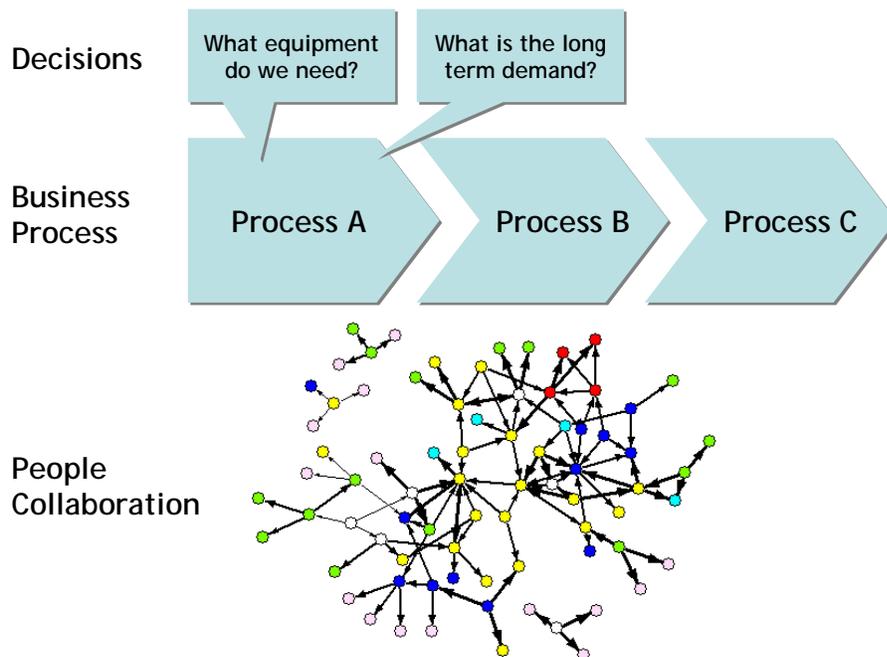


Figure 3 - Social Network Analysis linked to Business Processes

The figure demonstrates this approach by showing a traditional business flow (Process A, B and C), and examples of 2 decision points that are core to the execution of Process A. Circles represent employees involved in the business activity (color symbolise location). Arrows are used to identify who the participants seek advice from to make the decision. Individuals with the most arrows pointing to them are most central to the network.

The benefit of a SNA map is that it clearly shows who works with who, and also if the collaboration is one-way or two-way. Coloring the circles to symbolise e.g. location or department can be an effective way of identifying organisational silos.

Using HoloMaps and/or Social Network Analysis maps represents a powerful visualization of how an organisation collaborates. HoloMaps show relationships between roles in the network. SNA goes one step further to look at individuals. Based on the visualisations, you can now start thinking about who should ideally be involved in a process compared to who is actually involved. Have we forgotten to involve key stakeholders? Is information or knowledge flowing as efficiently as it should? Is trust-building collaboration being supported, or are we only focusing on supporting information exchange?

EXAMPLES OF BUSINESS PROCESS CENTRIC COLLABORATION

The following examples will demonstrate how collaboration linked to a business process will provide the necessary alignment to business objectives leading to performance improvements.

Example - Collaboration across the Supply Chain

One of the areas where collaboration has proved to add very high value across the extended enterprise is in Supply Chain Management (SCM). SCM is characterised by a number of participants (e.g. buyers, suppliers and consumers) depending on each other. In some industries, e.g. the Automobile industry, the number of participants can be in their thousands. The buyer needs to know when the supplier ships the goods, so the buyer can deliver on time to the consumer.

Hewlett-Packard (HP) deployed a team collaboration tool to improve its inventory planning process by enhancing collaboration between its small and mid-size suppliers (WCCIO, 2002). HP did this by providing a shared team-room that provided automatic notification of changes to production plans and inventory problems, threaded discussions and polling to resolve problems and fine-tune inventories. They also provided real-time reporting of their Enterprise Resource Planning system's inventory information.

To help organisations identify collaborative opportunities between supply chain participants (Pourier, C, 2002) Computer Sciences Corporation (CSC) has developed an approach called Partnership Diagnostic Laboratory (PDL). In a PDL a number of 'would-be' partners are brought together to analyse the relationship between them and to identify opportunities for mutual benefits through improved collaboration. Common ideas often include establishing a better communication system online, shortening cycle time from idea to approval, reducing transportation and delivery costs and cutting the need for inventory.

The sponsor of the PDL will normally be the nucleus organisation, i.e. the organisation that would be the most central in the entire supply chain.

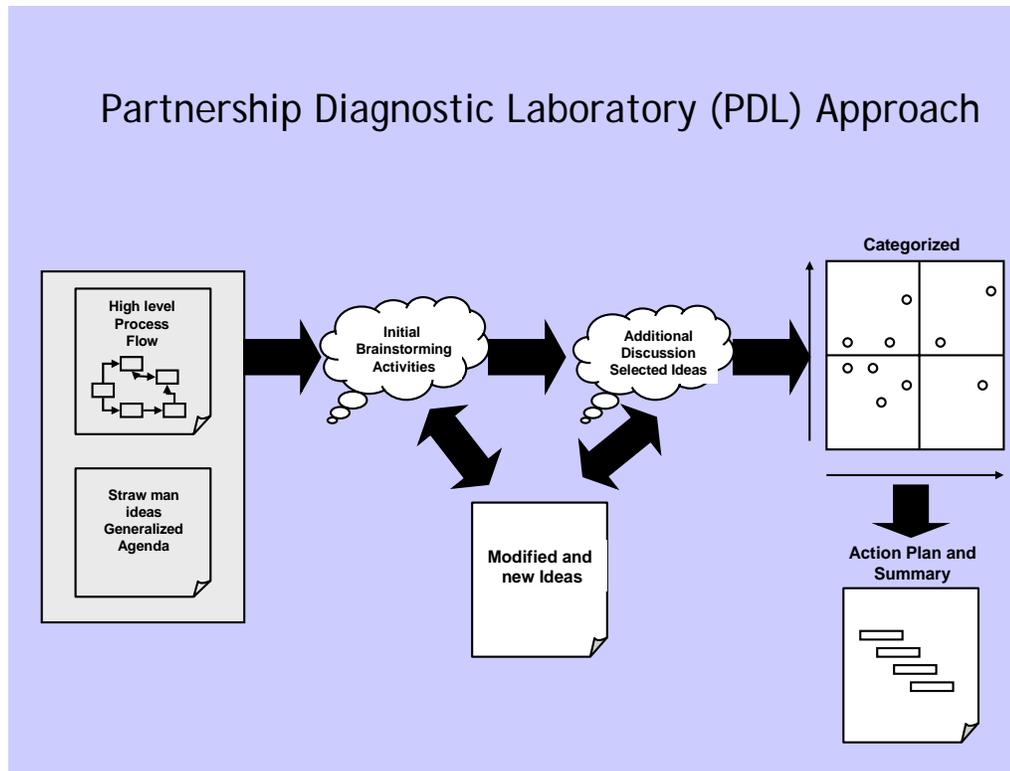


Figure 4 - Partnership Diagnostic Laboratory Workshop

During a PDL workshop opportunities are identified and then mapped to a table according to their ease of implementation and relative value of the opportunity. Action plans are developed, built on a shared sense of urgency.

Example - Business process centric collaboration in a global resources company

BHP Billiton, the world's largest diversified resources company, has an organisational unit consisting of approximately 40 highly mobile experts located around the world. The global unit oversees and coordinates Peer Reviews of proposed major capital investments. The Peer Reviews are completed before the company commits funds to the investment.

BHP Billiton learned that employees in the unit performed not just one, but many roles, and participated in many teams across the company. In some instances experts provided individual guidance to business units, and were sometimes seconded directly to project teams working on preparing a major investment proposal. In other instances they would revise the corporate investment methodology, oversee a Peer Review as a member of a cross functional team or manage and coordinate allocation of experts to projects.

When BHP Billiton took a closer look at the way the team worked, it became clear that the requirements for collaboration were very different, even within a single organisational unit working together in support of a single business process.

For example, to support coordination activities (who is working on what and when etc.) a web-based collaboration tool was deployed to enable all team members, including those in remote locations who did not have access to the central corporate network, to see the list of current projects and who was assigned to these. This was critical to find out who in the unit was working on what. To get an overview of 'who was where' and when, a group calendar and the associated processes and training was introduced. To support the experts in their

efforts to provide guidance to business units, training was offered in the use of a web-conferencing tool, enabling better contextual advice by sharing applications and documents in real time with internal customers.

So, the solution-set applied to improving collaboration consisted of a blend of processes, practices and technology which was very unique to the different kinds of team types within the one organisational unit.

TRENDS IN TECHNOLOGY

Developments in technology have in recent years given us opportunities we had only previously dreamt of. Videoconferences, previously only for a select few, are becoming cheaper and better. Web-conferencing tools are becoming more or less ubiquitous. Also, the workforce is rapidly picking up Instant Messaging.

One of the key trends is the bundling of technologies into packages. Gartner has coined the term Smart Enterprise Suites (SES) for an integrated set of tools that unite a number of related technologies. They define the features of an SES as including Content Management, Collaboration and Community Support, Information Retrieval and Process Management. This is all delivered within a portal framework (Gartner 2003).

This trend is somewhat in conflict with the focused requirement-driven approach presented in this paper. Many organisations will, whether they want it or not, end up with a series of different collaboration tools. But it can result in overlap in functionality and cause confusion. For example, a team-ware application might contain the same chat functionality as a learning management system that includes a virtual classroom. The core issue here is how to balance the enterprise need against business process specific needs.

We are now seeing many new product offerings in the collaboration space as well as new collaborative features being added to enterprise software e.g. ERP, Portals etc.. Without careful management one will end up with multiple tools, and multiple internal standards for what to use. This will have a negative impact on employees who just want simple technology that is easy to use.

There is light at the end of the tunnel with the coming of Service Oriented Architectures (SOA) and Web Services. Essentially SOA promises an ability to unbundled large software suites to use only those components that you require. Imagine if the presence awareness feature offered in Instant Messaging (IM) tools could be used by other applications, e.g. Microsoft Word or SAP. This could be used to see if the author of a document, or the person responsible for an order entry was on-line. Imagine that your team room folder could be a 'component' that could be readily reused in a number of applications that you work with to perform a certain business process. These services are made available to other applications as well as simply being made available to people through views as in a portal.

This is the type of collaboration services we can expect in the future with the emerging Service Oriented Architecture, clustered around Web services. One of the challenges the IT industry has faced when discussing the value of user-centric collaboration is that the focus concentrates too heavily on "tools" and then jumps too quickly to packaged application decisions (e.g. Web conferencing, team-ware, IM) (META, 2003).

By implementing this type of 'shared services' approach, organisations can reduce costs (through reuse) and complexity. This is done by deploying a set of common infrastructure interfaces across multiple applications, rather than introducing standalone application or platform infrastructure tied to a single application.

Such a 'shared services' approach, which builds on the Service Oriented Architecture for collaborative technologies, is still emerging. Groove Networks is an example of a company who has re-designed their peer-to-peer collaboration as such a service. IBM is also investing heavily in transforming their products to services.

Research conducted by CSC's Leading Edge Forum (LEF) (Brehaut, G., 2003) confirms an overall trend for the IT industry towards making applications visible as services. In other words, the trend towards technologies transforming into services is not unique to collaboration.

One of the challenges identified by the LEF is the level of granularity to which the services need to be divided. But the key is to first define what business and technology services the company needs. Then we need to abstract the service above the level of any particular vendor product. In reality, one vendor product may provide more than one service, or conversely, it might take several products to provide a particular service.

Collaborative services will be visible and easy to access through the services model where they can be integrated within business applications. We expect that it will take some time (2+ years) before the majority of vendors will be providing their current services as 'shared services'. This is because it has an impact upon application development. While we wait for SOA and Web Services we will need to effectively manage the plethora of overlapping functionality delivered by SES' and other product offerings.

By following the approach presented in this paper organisations will be well prepared for this journey. They will have a very clear understanding of what components they need to support various areas of the business in terms of collaboration technologies.

SUMMARY

Dramatic changes in the way we work are driving a need to deliberately target areas where enhanced collaboration can lead to business improvements. These changes include globalization, technology and increased inter-organisational collaboration.

Before an organisation can start to analyse where it can benefit from improving collaboration it must first understand what makes up collaboration (referred to as Collaboration Components), and to what extent the organisation has a culture in which collaboration can flourish. Organisations with different levels of maturity and readiness will need to approach collaboration in different ways.

We suggest that organisations will get most value by focusing collaboration on existing business processes, where performance metrics most likely will already be in place. Organisations should identify their requirements for collaboration by reviewing existing processes and key decision points within these processes. By using methods such as Holomapping or Social Network Analysis the formal and informal people interactions can be analysed, and areas for improvement in collaboration can be identified.

Finally, our advice for managing the plethora of collaboration tools coming onto the market is to apply a shared service perspective to your IT infrastructure. Avoid the temptation to acquire point solutions and provide support and encouragement to those vendors that support the service oriented architecture approach.

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