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Čulo, Ksenija; Skendrović, Vladimir

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PARADIGMS OF VIRTUAL TEAMS IN THE COMMUNICATION PROCESS

PARADIGME VIRTUALNIH TIMOVA U KOMUNIKACIJSKOM PROCESU

Ksenija Čulo, Vladimir Skendrović*

Faculty of Civil Engineering, University of Osijek, Osijek, Croatia; World Bank Consultant*

Građevinski fakultet, Sveučilište u Osijeku, Osijek, Hrvatska; Svjetska banka*

Abstract

The concept of the virtual team is not clearly defined and it often overlaps with notions of the networked organization, virtual communities, electronic commerce and teleworking. Viewed in this way, virtual teams are seen as a way of overcoming differences in time and geography through creating a virtual co-presence through the application of technology in order to work together and overcome some of the 'frictions' of time and geography. The problem of communication can be a technological phenomenom, but it could be a problem resulting from poor communication abilities of team members. Virtual teams often do not achieve their goals simply because team members do not communicate among themselves in an appropriate manner. The purpose of this paper is to present the paradigms of virtual teams in the communication process exploring the communication process within virtual teams like an interactive, and complex process in connexion with the advantages and disadvantages offered by information technology.

Sažetak

Koncept virtualnih timova nije potpuno jasno definiran i često se preklapa sa objašnjenjima umrežene organizacije, virtualnih zajednica, elektroničkog poslovanja i tele-poslova. Kada gledamo na ovaj način, virtualni timovi su način da se prevladaju razlike u vremenu i prostoru kroz oblikovanje suprisutnosti kroz primjenu tehnologije, s ciljem zajedničkog poslovanja i prevladavanje frikcija vremena i prostora. Problem komunikacije može biti tehnološki fenomen, ali može biti i problem koji potječe od slabih komunikacijskih vještina članova tima. Virtualni timovi često ne postižu svoje ciljeve zato što članovi tima ne komuniciraju međusobno na odgovarajući način. Svrha ovog rada je prezentirati paradigme virtualnih timova u komunikacijskom procesu, istražujući komunikacijski proces u virtualnim timovima kao interaktivan i kompleksan proces u vezi sa prednostima i manama koje nosi informacijska tehnologija.

1. Virtual team

The concept of the virtual team often overlaps with notions of the networked organization, virtual communities, electronic commerce and teleworking. Teleworkers are defined as individuals who work from home. In a broad generic sense, a virtual team is a group of individuals who work across time, space, and organizational boundaries with links strengthened by webs of communication technology. They have complementary skills and are committed to a common purpose, have interdependent performance goals, and share an approach to work for which they hold themselves mutually accountable. Members of virtual teams communicate electronically, so they may never meet face to face. However, most teams will meet at some point in time. Many virtual teams in today's organizations consist of employees both working at home and small groups in the office, but in different geographic locations.

Viewed in this way, i.e. by focusing on technology, virtual teams are seen as a way of overcoming differences in time and geography through creating a virtual co-presence (sometimes called virtual co-location) through the application of technology, in other words they exploit reliable and consistent communications in order to work together and overcome some of the 'frictions' of time and geography. In contrast to home based work and telework a greater proportion of work is carried out 'on-line' as hot distributed collaborative work. When teams are physically co-located, the co-presence required for 'hot' working is not a

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problem. However, when work becomes temporally or geographically distributed, what is meant by 'presence' can be problematical, as can the mediating effects of technologies used to achieve this.

Reasons for establishment of virtual teams in the workplace may vary, but in general one can say that virtual teams:

- allow for people in different parts of the world to come together to work on a project.
- create alliances and mergers between organizations.
- extend the market to different geographical locations.
- reduce costs for an organization.

Virtual teams are seen as project or task focused groups. Team membership may be relatively stable (e.g. in an established sales team) or change on a regular basis (e.g. in project teams). Members may be drawn from the same organization or from several different organizations, (e.g. when projects involve consultants or external assessors). Further distinctions can be made on physical proximity, (i.e. whether or not the team members are co-located) and by work-cycle synchronicity, (i.e. whether or not the team members are in the same time zones).

For a task group, the task usually provides the initial motivation to work together over time and space. A team is more than a group of individuals working in isolation. A balance of dealing with factual content, relationships and the coordination of a central process is required. Social aspects such as a shared social context, a feeling of trust and a human interest in each other need to be balanced against the more process orientated aspects, such as the planning of work and the scheduling of activities to maximize the overall performance of the group.

However, difficulties in the traditional environment can be significantly magnified in the virtual or remote situation. Difficulty with communicating, working together and producing high-quality, on-time results is typically heightened by distance. Effective leaders need to quickly, confidently and competently diagnose such issues and take deliberate actions to keep project team relationships, productivity and outcomes on track. There is even more emphasis on the use of appropriate communications skills to fit the needs of the people and the situation.

There are five core categories of effective leadership skills in virtual project team or distance-management situations /**1**/:

- Communicating effectively and using technology that fits the situation
- Building community, based on mutual trust, respect, fairness and affiliation among project team members

- Establishing clear and inspiring shared goals, expectations, purpose and vision
- Leading by example with a focus on visible, measurable results
- Coordinating/collaborating across organizational boundaries

When a virtual team is formed, each member of the team must understand that they are together an entity which is working towards the achievement of a specific goal. This means that every person in the team must have the same goal as all the other members and, therefore, every member of the team must communicate with the others.

2. Communications

Communication among team members can be described as one of the most important aspect of working in a virtual team. Far too often, virtual teams fail to reach their objectives simply because the members of the team fail to communicate with each other. The issue of communication can be a technological phenomenon, but in many cases, it is a problem that occurs because of poor communication skills on the part of the team members. Communication actually means electronic communication and, to a lesser extent, verbal or paperbound communication. Such a way of communication requires trust (i.e. confidentiality). Trust has been identified as a key factor leading to successful relationship development in virtual teams /**2**/. A critical task for team leaders is to engage the team in creating (and continuing to review and revise) an effective communications strategy. How can we create and follow a communications strategy for the team which adds value rather than creating overload? Too much communication about the wrong things is just as problematic as too little communication about important things. The basic questions are /**3**/:

- What, when and how much are we going to communicate?
- Where and how will we communicate?
- Who will play what roles in the team's communications?

One way to start developing a communications strategy is to look at the nature of the different kinds of work the team will be doing and what kind of communication is needed to support that work. There is a continuum which describes how individuals (or sub-groups) on the team are working from autonomously to interdependently. For example, there may be some tasks unique to a specific country which team members can do on their own without interacting with anyone else

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on the team. Other product-related projects may require more collaboration among team members in different parts of the region.

Once the issue of communication strategy has been solved, three aspects have to be considered: patterns, the process and technology.

3. Patterns

There are three dominant patterns of communications /**4**/, which can be used in any group. All three also have their place in the electronic communications used in virtual teams. However one of them, if over-used, can be destructive or indicate the absence of crucial group support structures. For simplicity these three dominant patterns of communication can be labeled as:

1. The Shout (one-to-many)
2. The Whisper (one-to-one)
3. The Gossip (one-to-some)

Shouting involves communicating with the whole group. It is a one-way broadcast communication, not requiring a reply. In nature it is achieved in the case of ants through scent trails (pheromones) and for bees via dances such as the waggle dance. Human groups need to be able to do 'reply able broadcasts', for example to schedule meetings, conduct polls or obtain feedback. However, it is more important for human groups to learn how to use one-way broadcasting much more. The current addiction to two-way messaging is one of the ways a group gets slowed down unnecessarily.

Whispering is a one-to-one private communication pattern. Not all conversations can be transparent -

some are simply not relevant to the group and others are inappropriate. A simple practical example of the need for whispering is on a web-conference where you need to get the administrators attention to say you wish to speak. Similarly the administrator may need to get your attention to tell you discretely you are talking too loudly, too quietly or too much. Whispering is also a vital group 'grooming' activity between team members where trust and rapport is built through regular one-on-one conversations.

Gossiping, which is defined as a private communication to some but not all members of the group, is the one you need to be careful about. Ad-hoc and random gossiping can be quite harmless and entirely useful in a group. However the danger arises when the gossiping recurrently involves the same subset of team members. An obvious risk is that a clique is being nurtured within the group which may, at some point, undermine the transparency and trust in a high-performing team. Alternatively, gossiping may indicate that you are missing a sub-group or a leadership ring. In the interests of transparency these structures should be made explicit to all and not kept as a secret.

Another continuum /**5**/ can describe whether the patterns of our work - the problems, the tasks, the day-to-day activities - are repetitive and routine, whether these patterns are changing, or whether new patterns are emerging. The nature of communications among the team about different parts of the work - including te frequency, the volume, and the degree of interactivity - is different depending on where that work falls in the matrix (Figure 1).

WHEN PATTERNS OF WORK ARE...	WHAT ARE COMMUNICATIONS NORMS WE NEED WHEN WE ARE WORKING ...	
	AUTONOMOUSLY	**INTERDEPENDENTLY**
EMERGING		
ROUTINE		

Figure 1. Team work matrix

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Routine/autonomous pattern: To the extent team members are working autonomously on tasks which remain static, there is little need for a lot of cross-team communications. Communications should be: minimalist, local, compliance oriented, where necessary, and automated whenever possible. The danger for virtual teams is that the "disconnected" feeling of a distributed team sometimes leads to over-reporting as a strategy to give people the feeling of "knowing what's going on." Sometime team members generate a lot of reporting in order to make sure the team leader "knows" that they are working. This kind of communication creates sludge in the team's arteries. It is a common cause of information overload which can sometimes result in team members avoiding engaging in the communications which actually are important to the team. The team needs to agree on a strategy to defend itself against communication sludge.

Routine/interdependent pattern: Team members need to provide enough information to each other about areas where their routine work is interdependent to enable them to coordinate. Communications should be: standardized, organized and easy. "Pull" v. "Push" meaning that you get what you need when you need it rather than having it pushed at you automatically. The danger for virtual teams is that because we have technology, which allows us to exchange and store large amounts of information, we do it because we can do it, without really addressing whether doing it adds value. The team needs to agree on a strategy to manage and coordinate this communication.

Emerging/autonomous pattern: When individuals (or sub groups) on the team notice changes emerging in the work they have been doing, it's critical to make this "intelligence" available to the team as a whole. Communications should be: timely (it can't wait for the next face-to-face meeting) and "Push" v. "Pull" (to make sure that nobody misses a key indicator). The danger for distributed teams is that a weak communications strategy results in missing signals where something new happening in one

place is a bell for something that will sooner or later have an effect on other parts of the system. A team that doesn't share this kind of intelligence is less than the sum of its parts. The team needs a strategy for scanning, scouting the environment within which they are operating, noticing pattern changes to make sure that important things get up on the team's radar screen soon enough, when something which has been static starts changing. But it's not enough to simply report the information, it's critical that the whole team have an opportunity to discuss its meaning.

Emerging/interdependent pattern: When members of a team can work together on developing strategies to respond to changing conditions you get the biggest payoff for having teams. This is where the team becomes more than the sum of its parts. Communications should be: rich, conversational, and continuous and should involve everyone. The danger for distributed teams is that their communications in this area become disjointed because the team lacks the environment to support substantive, ongoing (between face-to-face meetings) discussions. New skills are required to engage with each other effectively at different times from different places. This is where the team should spend the bulk of its communications resources. A team that does this well can become a complex adaptive system which creates strategies, processes, and new approaches flexibly in response to changing conditions (politics, competition, new products).

4. Process

Having as a basis the classic model of communication by Shannon /6/ and taking into consideration the particularities of communications within virtual team as described by Duarte and Tennant Snyder /7/ and Wickham /8/ the following scheme of communication process within virtual teams /9/ can be established (Figure 2).
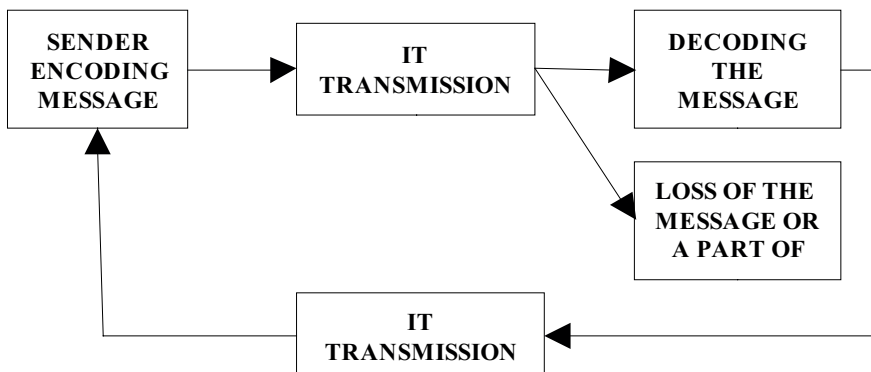

Figure 2. Communication process

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The communication within virtual teams can be described as interactive, complex and limiting process.

Communication interaction is due to the facilities given by information technology. Sending the message by means of Internet technology makes the relation between sender and receiver to be established in a very short time even if the messages are not directly sent to the receiver. The interactive process can be realized in different relations:

1. one sender – more senders,
2. one sender – more receivers,
3. more senders – more senders,
4. more senders – more receivers.

Due to the use of information technology, coding and decoding the messages are made automatically without important modifications of the message. But there is a possibility that the message can be totally or partially lost. This can lead to delays in the communication process and to a certain mood of uncertainty between the members of the virtual team. The consequences of losing totally or partially the message are all the more serious if the communication is realized between more senders, because it will be difficult to identify the 'missing link' among the series of messages between the members of the team, and thus, the team may not to be able to realize its objective in a timely manner.

Communication complexity is the result of diverse competences of the virtual team members /**10**/, instability and weak demarcation of the roles within the virtual team. The members of a team with diverse competences gather much more abilities, skills and knowledge /**11**/ that can contribute on one hand to improving the performance, and on the other hand it can affect negatively the cohesion of the group, because of some lacks in the communication process.

Cultural diversity within virtual teams can lead to an inexact understanding of the message, especially if taking into consideration the lack of body language that, in some cases, has the role of emphasizing or completing certain essences of the message.

Some authors like Belbin /**12**/ and Davidson /**13**/ consider that the establishment and the diversity of roles within a team have a great impact on the performance and the sharing of knowledge as well as on collaboration and communication among members of the group. Regarding the conflicts in virtual teams, the cognitive conflicts that influence directly the team's performance have a bigger probability of appearance, than the affective conflicts as found by Simons and Peterson /**14**/.

Communication limitation is due to the lack of expressivity of the message that has been sent, since the exchange of some informal information is practically limited both in time and in space due to the lack of "face - to - face" communication. Messages within a traditional team include series of formal and informal signals or information that gives the recipient more clues about the way how to interpret the message. On the other hand, the message coding, decoding and feed-back take place instantly and lead to more control on disruptions during the transmission process and to a better monitoring of the impact of the message on the receiver, and thus a possibility of an immediate correction of the message.

5. Technology

Information technology support to virtual teams should conform to the principles of communication, collaboration and coordination /**15**/ as shown in Figure 3.
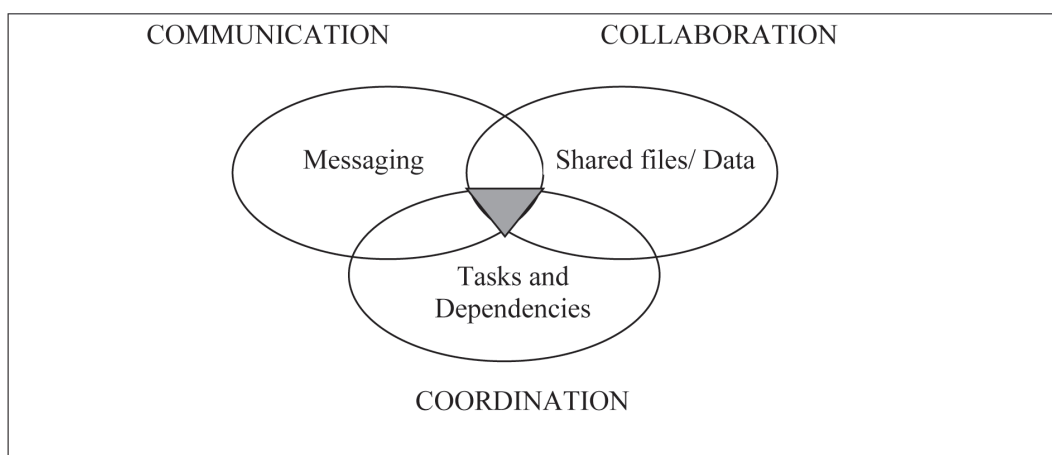

Figure 3 - Basic supporting software principles

Communication is typically carried out in several ways of exchanging messages between team members. Collaboration is done by sharing documents and other project files. Coordination is basically manifested through tracking given project tasks and its dependencies. To successfully comply with these tasks, all three principles should be applied.

Cooperative work in virtual teams on sensitive project tasks requires the proper implementation of security mechanisms. Business and development activities ought to be managed in confidential manners and sometimes also to be conformed to very strict security regulations that the project team complies. There are important prerequisites for establishing collaborative, secure and reliable but user-friendly environment for information technology support /**16**/:

- Confidentiality. The confidential data is intended for authorized parties, so authorization mechanisms are also required, such as, for example, access control lists. Confidentiality is a necessary prerequisite for virtual team and trust building /**17**/.
- Authentication. Only the authenticated users are allowed to access the data. One of the most used authentication mechanisms is a password authentication.
- Message integrity. Transmitted and stored data must not be altered and tampered with. In order to assure these conditions, communication must be supported with cryptographic mechanisms, such as one-way hash algorithms.
- Non-repudiation. When user performs an action on data, it must be linked to the user so he cannot deny performing the action. When concerning non-repudiation of communication, it is important that a sender cannot deny having sent a message, and recipient cannot deny having received it.

Technology must be simple, powerful and integrated. In order to capture critical communication, the team needs collaborative technology that integrates information and communication structures and aligns them to the team's functional processes. However, this is not as simple as one may expect.

Virtual teams are often spread all over the globe, ranging from different offices to different cultures; so how is it that they can remain on track with objectives and come together to achieve goals to contribute to the organization? The answer is that they use collaborative technology - in particular they use software that allows virtual teams to be as efficient as same-location teams.

In an era of pencil and paper, teams used file folders and notebooks to organize the team's plan, work products, and communication, which collectively comprise an analog group memory. The team leader tracked progress toward goals using a hub-and-spoke information exchange whereby information was captured on paper forms from each individual team member. The team leader then combined, aggregated and summarized these individual reports in order to produce various reports that were then distributed to management and stored in filing cabinets. While Email and file servers have since replaced the paper notebooks and filing cabinets, team leaders follow the same hub-and-spoke process of collecting updates. This means that they are still left to combine, aggregate, and summarize individual updates from documents that arrive in their inbox.

While the most common way of moving ideas, thoughts, decisions, and documents around in today's virtual teams is through Email, it has several shortcomings that make it a poor choice for being the primary platform for team communication /**18**/. From a team memory perspective, Email is like a sieve from which valuable information leaks out. The following are key problems in using Email to support teams /**19**/:

- Not group memory. By definition, an inbox is an individual's memory and only accessible by that individual.
- Fragmented threaded conversations. People send messages to the whole team. Several members will then "reply-to-all" which creates different versions of an Email thread intermingled with other messages.
- Assumes communication needs are same for all members. Different team members have different communication needs both in content and time.
- Exclusion. Intentional or not, team members can send messages to just a few members of the team. The other team members may have something to contribute to the conversation, but often there is value in just being aware of the conversation.
- Poor communication tool for planning. Prior to information technology, planning was a pencil and paper exercise with frequent meetings to collect status. With the advent of Email, team members send updates, or more likely the team leader hounds them to send updates, on the status of their actions. The team leader must then collate the different messages, again intermingled in his or her inbox, and then re-enter updates to a master plan, which may be

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in a spreadsheet, word processing document, or project management software.

- Poor support for creative processes. This includes lack of support for idea generation, ranking and rating ideas, viewing results, and building upon them. While initial ideas can be surfaced in Email, they quickly run into the fragmented threaded conversation problem.
- Poor tool for managing documents. Most often, team members will send a version of a document to multiple people for review and editing. The problem becomes one of determining who has the latest version. If two people decide to edit the document at the same time, there will be two different versions of the document as a result. Someone will then have to carefully review both versions to create a combined third document.

Does it mean that there is not a role for Email? No, it, as well as instant messaging, is extremely powerful as an alerting mechanism when communication is urgent. However, it is has become a less powerful medium, because of the volume of non-urgent information that gets distributed.

One of the powerful capabilities of information technology in support of teamwork and to overcome the shortcomings of Email, are collaborative technologies such as a digital group memory to which all team members can have direct access. Team members can contribute to it, view it, and manipulate it. Team leaders no longer need to waste time combining individual updates from Emails because team members update the digital group memory directly. Furthermore, when new members or experts need to be brought on board, they can be given access to the team's digital group memory to orient themselves to the specifics of the team's work. This is in contrast to forwarding them months and months worth of fragmented Emails and pointing them toward a file server. While all team members use the digital group memory daily to communicate about relevant information regarding the team's work, there are additional technology needs when team members cannot meet together in the same room. In conjunction with audio-conferencing, real-time collaborative technology provides for screen and application sharing, which facilitates the display of a presentation, for example. The digital group memory is also used to capture action items and notes during the meeting. Digital group memory will change the pattern of communication from member-to-leader to member-to-member, including the leader. In the current environment, the team leader is a bottleneck where all information is collected, combined, stored, filtered and redistributed. Team members update the team leader via Email and

meetings. The team leader combines the status updates from each individual and re-enters the updates into a plan file on his or her PC. With the digital group memory, team members update the plan and provide other information directly. The team leader as well as other members can view the information directly. As a result, team members can view interim updates as they are written rather than waiting on a meeting or a report produced by the team leader.

Collaborative technologies have one or more of the following seven core capabilities /**20**/:

- Document management - facility for team members to work on documents jointly; features include: ability for a team member to check-out/check-in of a document; versioning; and ability to retrieve back versions.
- Threaded discussion - facility for organizing related communication, or conversation threads; typically displayed in a hierarchical fashion with replies being indented.
- Group idea generation and evaluation - facility for documenting and organizing ideas that team members can build upon and evaluate.
- Group calendar - facility for displaying team events and milestones in a calendar format (e.g., day, week, month, year).
- Group contacts - facility for team members to add and retrieve information such as Email address, postal address or phone number, for contacting other team members.
- Real-time chat - facility for real-time text-based discussion when team members are present at the same time; team members enter messages which are displayed simultaneously on each member's screen.
- Real-time application sharing and screen sharing - facility for displaying and operating applications of one team member on other team members' screens. For example, one team member displays and reviews a presentation file. All team members will see each presentation slide displayed on his or her screen at the same time but controlled by one team member.

Individually, these capabilities have been used successfully to support certain aspects of teamwork. Since much of the output produced by business teams is a document, it's not surprising that one of the most prevalent technologies used is a document management system. The document is stored in a file folder hierarchy structure. Team members will check the document out to work on it, and then check it back in when finished. This process allows only one person to manipulate the file at a time. Unfortunately, the conversations about the work objective to which the document is related

are carried out in Email. Collaborative technology needs vary by team as well as throughout the life of a team; therefore, the technology must be easily adaptable to suit team members. A sales team needs to manage its opportunity pipeline, while a new product development team evaluates new features to incorporate into a prototype. A management team is likely to engage in a series of brainstorming sessions to develop a business plan and then shift to a project-oriented focus in order to execute on the plan. To date, however, collaborative technologies have not worked due to a lack of integration and alignment to team and business processes. And because collaborative technologies have not been well integrated, aligned to support team and business processes, nor made simple to use, teams have continued to rely on Email as the primary communication tool.

6. Conclusion

With the explosion of the Internet using high-speed connections, every team already has a virtual element because Email has become an integral part of the work whether or not team members are dispersed or co-located. But information technology can do much more for virtual teams and their organizations. However, a fundamental shift in how teams function is necessary. Moving from Email to more effective forms of collaborative technologies is like moving from the classic hub-and-spoke communication of "team leader-to-team member" to a "team member-to-team member" pattern. The immediate benefit is that the team leader will spend less time collecting status, collating information, and re-entering data for, say, a management report. Instead, the leader will simply package content that exists as a result of the team using collaborative technologies. This makes more time available for the leader to support team members through coaching, supervision, and looking ahead. The team and business processes shift from being discrete events to ones of continuous flow that have synchronization points along the way for in-depth, face-to-face problem identification and problem solving. For the team members it also means less work for they have immediate access to the latest information and no longer have to create their own conclusions by sifting through strings of Emails.

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