CHAPTER 1

Mapping Out the Creative Process and Work Design Approach

There is a kind of iteration or reiteration cycle that keeps happening, individual work and then back out to the group. Some people will tear the project apart, others will say it looks great, and still others will offer a couple of ideas. And over a period of a month or so, it comes together into a final product, which gets together in a reasonable form and then [is] sent back out again. So there seems to be this kind of cycling of individual work, send it out, get comments, and bring it back.

Matt, ACI

IT IS NOT SURPRISING that contemporary organizations, faced with global competition and external environmental turbulence, require highly creative teams to survive. The need for creativity is particularly critical for virtual teams, teams that join individuals from across the globe to meet the demands of this fierce competitive global marketplace. The literature on virtual teams is expanding. Many (including myself) have argued that virtual teams

are no different from more traditional face-to-face teams and that the skills and processes needed for effective virtual teams are the same as those for co-located teams. However, it has also been suggested that for virtual teams these same skills and processes may be more difficult to establish and take more time and effort to develop than in face-to-face teams.

In this chapter, one of the key processes of virtual teams is examined—the process through which members of these teams create. What is involved in a virtual team's creative process? How is a virtual team's creative process similar to or different from that of traditional, co-located teams? The purpose of this chapter is to address these questions.

This chapter contains several different threads of discussion. The chapter begins with an overview of the major approaches in the study of the creative process—linear, intuitive, and componential approaches. Then it presents a model of the unique stages of the creative process for virtual teams. This model is then compared and contrasted with the more traditional creative process models. Following that, three work design approaches commonly used by virtual teams to accomplish their creative efforts are described—the wheel, modular, and iterative approaches. Finally, an assessment tool is offered to assist virtual teams in appraising the current functioning of their creative process.

Major Approaches in the Study of the Creative Process

The creative process refers to the activities that occur while a person is creating. For years, a myriad of researchers and practitioners have examined the creative process. Theoretical models that attempt to conceptualize the creative process typically fall into one of three major approaches: (1) A linear approach, in which the creative process is viewed as a logical problem-solving process, (2) An intuitive approach, in which the creative process involves the use of insight, intuition, imagery, and a sudden change in perception, and (3) A componential approach, in which the creative process is only one element among the entire set of abilities, skills, traits, and processes that are involved in creative behavior.

These major approaches are described in more detail next.

The Linear Approach: A Logical Path of Problem Solving

Here the creative process is viewed as a logical, patterned sequence of steps or stages through which an individual or team moves to define, clarify, and work on a problem and then produce a solution to that problem. Individuals or teams make a conscious attempt to sit down and attack a problem or task using several linear creative problem-solving techniques.

Many theoretical models of the creative process further clarify and elaborate on the exact steps included in the process leading to a workable solution to a problem. One example is the "Complete Creative Problem Solving Process" developed by Min Basadur (1994). In this model, creative behavior is defined as a three-stage process that includes problem finding, problem solving, and solution implementation. Within each of these stages are two thinking processes, ideation (idea generation without evaluation) and evaluation (judging how useful a generated idea is). Eight steps then occur across these three stages.

Three steps are involved in the first stage of problem finding: problem finding, fact finding, and problem defining. In the *problem-finding* step, problems are initially sensed and anticipated as the environment is scanned for present and future problems. Information related to these newly sensed problems is then actively gathered in the *fact-finding* step. The facts are subsequently evaluated, and the most useful are utilized to develop a workable problem definition in the *problem-defining* step. Then, the problem definitions that appear to be most advantageous to solve are selected.

The process then evolves into the problem-solving stage, which contains two steps: idea finding (solution-finding), and evaluation and selection. In *idea finding*, a large number of potential solutions for the problem definitions are generated. Following that, a smaller number of the most useful solutions are selected in the *evaluation and selection* step. During evaluation and selection, criteria are established to determine which solutions are most appropriate for moving forward into the third stage, solution-implementation. A key characteristic of the solution-implementation stage is recognizing that problem solving does not end with having developed a good solution. Three steps comprise the work of solution-implementation: (1) *action-planning*, where specific action steps are created for successful implementation of the solution; (2) *gaining-acceptance*, where alternative ways are generated to create ownership among those affected

by the suggested action; and (3) *taking-action*, which involves the actual doing of the action. The model takes a circular form, where the ninth step is in actuality the first step of the next rotation or cycle to the creative process. Each action taken to implement a new solution automatically results in new problems, changes, and opportunities as it interacts with new elements in the environment.

Some of the models within the linear approach take on a more flexible view of the creative process. Stages or steps are not viewed as a fixed number to be applied in a predetermined order, but are viewed as tools that are available when and as needed, for individuals or teams working on problems or open-ended tasks. One such example is the Creative Problem Solving (CPS) model. The model was initially developed by Alex Osborn (1963), the creator of the popular brainstorming technique used for idea generation. Osborn's model was further refined by creativity experts Sidney Parnes (1981) and Treffinger, Isaksen, and Dorval (1994). In the current form, the CPS model has six stages, which have been clustered into three general components: (1) Understanding the problem (mess finding, data finding, problem finding); (2) Generating ideas (idea finding); and (3) Planning for action (solution finding, acceptance finding).

The Intuitive Approach: Intuition and Insight

For those who view creativity from a more intuitive perspective, the creative process is viewed as involuntary. It involves a relatively rapid change in one's current way of thinking or perceiving. What occurs is a mental transformation that allows new ideas, meaning, or solutions to be suddenly discovered. There is little or no experience of a particular path one follows to a solution (as in the linear approach). The creative individual is often left to wonder "Where did the thought come from?" Intuitive techniques (discussed in detail in Chapter Six) emphasize developing in an individual or team a state of inner calmness (through the use of imagery, meditation, or visualization) to prepare individuals to access the intuitive solution when it arises.

In this approach, the use of intuition and insight are necessary to achieve promising creative results. Intuition has been characterized as an unconscious process that is created out of one's past experiences. It involves relying on one's gut feeling about what is the right decision or direction to follow. Insight has been formally defined as a process where an individual or team suddenly moves from not knowing how to solve a problem to just simply knowing how to solve that problem (Mayer, 1999). Although the phenomena of intuition and

insight may overlap, they can be distinguished from one another. According to Emma Policastro, "Intuition entails vague and tacit knowledge, whereas insight involves sudden, and usually clear, awareness. In the context of creativity, *intuition may precede insight*" (italics added) (1999, p. 90).

Intuitions are frequently used early in the creative process to guide decision-making. Experts often use intuition to size up situations quickly and accurately to decide on a specific and effective course of action. Evidence from several sources supports the importance of intuition in the creative process of both artists and scientists. In addition, top executives frequently rely on intuition to assist in making important decisions. These same executives have indicated that in most circumstances their initial intuitive hunches proved to be right. The creative process then continues after this initial use of intuition, as the individual or team moves through a sequence in which a vague and implicit sense of what is right transforms into an explicit and integrated knowledge of how to produce the needed creative results (Policastro, 1999, p. 91).

Intuition is often regarded as most useful in situations characterized by high stakes and uncertainty, by limited facts to assist in decision-making, by several plausible alternatives to choose from, and by pressure to make the right decision in a limited amount of time. In situations that require urgent action, there simply may not be the time to go through the logical stages and steps outlined in the linear creative process models. In urgent and pressing situations, one may choose intuition out of necessity—there isn't always time to analyze each existing alternative.

Although intuition may be the initial spark in a long path toward a creative outcome, insight is often characterized as a sudden revelation, transformation, change in perception, or "ah-ha" experience. In reality, insight is rarely as sudden as it may appear. Creative insights are generally the result of much prior reflection, knowledge, and action.

Insight is sometimes seen as one stage of several that occur in the course of the creative process. The most traditional analysis of stages in the creative process was originated by Graham Wallas in 1926 in *The Art of Thought.* Wallas proposed a four-step model of the creative process: preparation, incubation, illumination, and verification. *Preparation* involves exploring and clarifying the situation, looking for what the real problem is, thinking about what may be needed to work toward a solution, and gathering and reviewing relevant data. In the *incubation* stage, conscious work on the problem is suspended. The

creative individual does not consciously work on the problem presented, but rather engages in things totally unrelated to the creative activity. Even though conscious work is suspended, a series of unconscious and involuntary mental events are stirring about, ready to spring forth into a revelation of sudden insight in the *illumination* stage. An "ah-ha" or "Eureka" feeling is experienced. There is a sudden change in perception, a new idea combination, or a transformation that produces an acceptable solution to the problem at hand. This period is usually accompanied by a feeling of excitement and renewed interest in the creative activity. Insight, then, plays a key role in the illumination stage. *Verification* involves the use of logical and rational thought to translate this sudden insight into an appropriate solution. Evaluation of proposed solutions is made against objective criteria.

The Interplay of Linear and Intuitive Approaches

In real life situations, both linear and intuitive thinking are needed to produce highly creative results. A typical pattern in the creative process may involve logic preceding and following intuition and insight. The key difference between the two ways of thinking is that in more linear views the creative process is sequential. In intuitive approaches to creative activity, the process is holistic. Thus the creative process is a combination of hard work, logic, and intuitive insight.

The Componential Approach: Capturing the Complexity of Creativity

The creative process is only one element in componential models of creativity, which specify abilities, skills, personality traits, and processes involved in creative behavior (Lubart, 1999, p. 295). Although the exact components necessary for creativity vary from model to model, what they have in common is their capacity to capture the complexity of creativity with one framework. Componential models add further value by providing components on which highly creative individuals and teams may be assessed and identified, and by providing areas in which training may be developed for creativity enhancement. One of the first componential models of creativity was proposed by Teresa Amabile (1983, 1996) in her work on the social psychology of creativity.

Amabile described a set of three components as necessary and sufficient for creative production: (1) Domain-relevant skills such as factual knowledge, technical skills, and special talents; (2) Creativity-relevant skills such as appropriate

cognitive style, knowledge of heuristics, and conducive work style; and (3) Task motivation such as the individual's attitude toward the task and self-perception of motivation for undertaking the task.

The process with the highest creativity contains high levels of all three components. In addition, each of the three components contributes in varying degrees to five stages of the creative process. In the first stage of the creative process, a *task or problem is presented.* The component of task motivation is crucial, for it determines whether the individual will engage in the task at all. In the second stage of the creative process, individuals *prepare to generate solutions* by building up or reactivating a store of information relevant to the task or problem. Domain-relevant skills are of particular importance in this stage. In the third stage of the creative process, the individual *generates possible responses and solutions.* Both creativity-relevant skills and task motivation are important and can affect both the quality and quantity of ideas generated. In the fourth stage of the creative process, the *responses or solutions generated are evaluated and validated* for their appropriateness or correctness to the task at hand and *communicated* to relevant stakeholders. Domain-relevant skills provide the knowledge and assessment criteria to be used in this stage. In the fifth stage of the creative process, *an outcome is achieved* that is based on the results of stage four. If an idea is accepted, indicating success, or rejected, indicating failure, the creative process ends. If the idea is not wholly appropriate but does contribute significantly to solving the problem, the process returns to stage one. (For more information on other componential models of creativity, see Finke, Ward, and Smith, 1992; Mumford and others, 1991; and Runco and Chand, 1995 [cognitive-components approach]; Woodman and Schoenfeldt, 1990 [interactionist approach]; Sternberg and Lubart, 1991 [investment approach]; and Feldman, Csikszentmihalyi, and Gardner, 1994; Gruber, 1989 [systems approach]).

Stages of the Virtual Team Creative Process Model

Until recently, knowledge about the creative process had been limited to the study of individuals and organizations and, in some cases, groups or teams. However, the groups investigated have been traditional, face-to-face problem-solving groups. In this section, a new model of the creative process is presented, one that has emerged from my discussions with virtual team members about

how the creative process evolves in their teams. As will be seen, the virtual team creative process model has much in common with the more traditional creative process models discussed in the previous section. However, there are intriguing differences as well.

Virtual teams follow a path of four stages in their quest toward the production of creative results—idea generation, development, finalization and closure, and evaluation. The *idea generation* stage is ignited when someone on the team recognizes an unmet need, asks a question, or simply feels that exploring a specific endeavor would be intriguing. As Rick, a member of the ELC team, explains, "Well, when I instigate something, it's usually because I see the need. But sometimes it's just creativity, you know, this would be cool." An individual team member (or a group of individuals within the team) then becomes the kicker and suggests an idea to the entire team. If the rest of the team agrees that the idea is worth pursuing and committing some initial time and resources to, the kicker then champions and begins to further define and mold the idea.

After the kicker's efforts are drafted, presented, and disseminated to the rest of the team, an iterative stage of *development* follows. Here, the team (or subset of the team) works to develop a product, project, or service that meets the initially-proposed need, answers the initially-proposed question, or brings into action the specific endeavor that was found to be intriguing. Team members exchange drafts, designs, or prototypes back and forth, offer feedback to one another, and, as a result, continue to make revisions. Matt (of the ACI team) describes this period as a cycling of individual and group work. (More about this iterative process will be described in the section on work design approaches.)

> A creative experience typically would start with two people saying, "What if we did X," or "We need to do X." And typically one person would say, "I'll take a lead on this. Let me scratch out some possibilities we ought to consider." Initiators will usually share possibilities on-line. People will respond electronically: "I like that, let me take A, you take D, and she'll take X." And they will do a little work around that and then put that up for a reaction. So the process begins with one initiator deciding "It's about time and I'll take the lead." Then, a template is developed that allows team members to grab pieces that interest them and do some creative individual work. Then, members will bounce their efforts off of one another. Such are the stages. An individual initiates, a couple of oth-

> ers kick ideas around, come back to a starting nucleus of possibilities, divvy up those possibilities, respond to possibilities, and then bring their initial work back to the team to consider and assess. And there is usually one person who takes responsibility for kind of guiding the development work through all that iteration.

Once ideas are developed into workable outcomes, the creative products are *finalized* and implemented. Here the team makes one last review and pulls together any last-minute loose ends. *Closure* occurs just before implementation of the product, project, or service. It's almost like the last push in the birth of bringing the creative result into the world. After implementation, an *evaluation* period follows, in which team members get together and assess the strengths and weaknesses of the completed project.

Although four stages to the creative process for virtual teams have been proposed, it is crucial to realize that these stages may not be mutually exclusive. Activities in one stage may overlap and recur in another. For example, idea generation can also occur in the development stage; ideas need to be developed while they are being generated, and ideas are often evaluated before being fully developed. The trouble with viewing the creative process from a stage perspective is it attempts to linearize a process which in reality may be non-linear. Nevertheless, stage models are useful for organizing the decisions and activities involved in the creative process. Perhaps a better way to think about the stages of the creative process is, as Eveland (1990) suggests, to not "think of the sets of behaviors defined in most stage/phase models as steps on a stairway, but rather as rooms connected by a finite number of doors. Each room has core behaviors that take place within it; movement between rooms is divided by marker events that tell us when we are making significant behavioral transitions from one kind of activity to another" (pp. 30–31).

Comparing Traditional and Virtual Team Creative Process Models

As I began to undertake a comparison of the creative process models discussed thus far, a series of overall steps in the process leading toward a creative result began to emerge. The process begins with an initial scan of the environment for pressing problems, challenges, or opportunities. Facts are then gathered to further clarify the problems identified in the initial scan. After the facts have been sorted through, the problem or problems are more formally defined. What follows is a

progression of steps leading to taking action, which include: (1) Generating and then evaluating solutions to the defined problem(s), (2) Creating an action plan for implementing solutions, (3) Gaining acceptance from those who will be affected by the proposed action, and (4) Taking the action. After implementing an action, an evaluation period may occur to clarify needed modifications and revisions. In Table 1.1, the columns list each of the overall steps in the creative process (across the top). The corresponding steps and/or stages in each of the specific models discussed are listed in the rows. Arrows indicate that a step or stage of a particular model includes more than one of the overall steps of the creative process. An empty box indicates that a particular model does not have a corresponding step or stage for that particular overall step of the creative process.

What is evident is that not all of the overall steps are included in each individual creative process model. In addition, in some creative process models, several of the overall steps are subsumed in a particular step or stage of an individual model. Interestingly, only three out of the five models (Amabile, 1983, 1996; Basadur, 1994; and the virtual team creative process model proposed in this chapter) address creating an action plan and taking action.

At first glance, the virtual team creative process appears simplistic compared to the other linear creative process models (Basadur, Creative Problem Solving). This may be partly because virtual teams have been created around the need to develop cost-effective, instantaneous responses to customer and market demands. This electrifying pace with which business can and does take place electronically may leave little room for all the steps outlined in a more traditional linear approach to creativity. Intuition and insight may play a role in helping team members gain initial agreement on what intriguing ideas should be taken into the development phase. Additionally, in virtual teams, clients or managers often present team members with problems and challenges, which eliminates the need for protracted work on finding and defining problems. It does appear that in the creative process of virtual teams there is more of a push to get to development quickly. There is less emphasis on sorting through an abundance of problem definitions, and more of a focus on assessing whether presented or sensed problems are worthy to pursue. In addition, as previously stated, the iterative stage of development in the creative process of virtual teams implies a more flexible view of the creative process, where activities occurring in one stage may overlap or recur in another stage. The boundaries between the four stages of a virtual team's creative process can often become blurred.

Table 1.1 Comparison of the Stages and Steps Across the Creative Process Models

Model	Initial Scan	Gather Facts	Define Problem	Generate Solutions	Evaluate Solutions	Action Plan	Gain Acceptance	Take Action	Evaluate Action Taken
Basadur	Problem finding	Fact finding	Problem defining	Idea finding	Evaluation and selection	Action planning	Gaining acceptance	Taking action	
Creative Problem Solving	Mess finding	Data finding	Problem finding	Idea finding	Solution finding	Acceptance finding	→		
Wallas	Preparation	→	→	Incubation (unconscious), Illumination (conscious)	Verification				
Amabile	Preparation	→	Problem and Task Identification	Response generated	Responses validated		Communication	Outcome	→
Virtual teams–Nemiro	Idea generation	→	→	Development	→	→	→	Finalization and closure	Evaluation

The virtual team creative process model contains many similarities to the other creative process models. The idea generation stage of the virtual team creative process includes a kicker actively scanning or searching for an intriguing problem or sensed need. The kicker finds additional data and facts, further molds the problem, and then presents initial problem definitions to the team. The period of development can begin with illumination, solution finding, and response generation, where the team, now committed to the initial challenge and to some initial ideas for solving that challenge, begins further work on generating and evaluating appropriate solutions. Verification, acceptance finding, and response validation and communication also occur during the development period.

The stages of finalization and closure and evaluation are similar to Amabile's outcome stage where a solution is reached and implemented and some kind of outcome occurs as a result. However, the virtual team creative process model that emerged in this investigation is probably most similar to the model suggested by Basadur (1994), with the three stages of problem finding, problem solving, and solution implementation. The last stage, which emphasizes implementation, action planning, and gaining acceptance, is not included in most of the other creative process models, which typically end once the appropriate idea has been selected.

Traditionally, creativity has been viewed as the generation and selection of new ideas, and innovation as the implementation of those new, creative ideas. Creativity and innovation, for the most part, have been characterized as two separate processes. Creativity involves only "thinking up new things" and innovation only "doing new things" (Peters and Waterman, 1982, p. 206). This is a simplistic view, as it implies that creativity is largely cognitive and innovation largely behavioral. In a conceptual paper on group creativity, Nemiro and Runco (1995) pointed out the difficulty with viewing creativity and innovation as two separate processes.

> Surely innovation requires some thought, and creative insights may follow from actual activity. Just as surely there can be some interplay; a creative idea may suggest an innovation, which in turn suggests new and creative possibilities. Part of the problem is the either–or assumption, the dichotomy that artificially separates creativity and innovation.

In the virtual team creative process model, there is no dichotomy between creativity and innovation. They are intertwined, as ideas are generated, devel-

oped, finalized, and then evaluated. Teams may, however, proceed through each of these stages using different methods to accomplish the work. The work design approaches that were used by the teams I interviewed are discussed in the next section.

Work Design Approaches Used During the Creative Process

Three work design approaches—the wheel, the modular, and the iterative approach—emerged from the virtual team members' stories of how they moved from initial idea generation, through development, to finalization and closure of a creative effort. These approaches were not mutually exclusive, as most of the teams used more than one.

The Wheel Approach

The wheel is a classic type of communication network (Katz and Kahn, 1978), in which there is one key person who communicates to all team members. Members on two different status levels make up the network—a high-status member (the leader or supervisor) and lower-level members or assistants. The higher-status member is usually referred to as the hub or center of the network, through which all communication must pass. In a classic wheel communication network, there are no direct communication links between any of the lower-level members.

One team investigated, the WN–Religion Forum team, used the wheel approach to communicate and exchange information while creating. Although all team members did potentially have access to one another (through e-mail and phone), rarely did any of the assistants actually communicate with one another. The creative process began with either the team leader parceling out assignments to each team member, or individual team members proposing their ideas directly to the leader. Development of a creative idea occurred between the team leader and an individual team member.

The Modular Approach

One of the most common work design approaches used during the creative process of these virtual teams was the modular approach. In this approach, team members met initially to decide on the need, task, or project to be pursued. Then, as a group, the work was parceled out or distributed among team

members, usually based on each individual team member's expertise or interest. Team members then went off to work on their "pieces of the pie," sometimes by themselves, sometimes with one or two other members of the team. After the work was completed, the efforts were presented to the group for feedback before finalization and implementation. Revisions were done as needed. The entire team, then, assessed the creative outcome, which in reality was a compilation of all the individual pieces put together. One team member succinctly describes the modular approach: "Oh, when everybody had a job and they were able to do it, and everyone did these tiny little pieces, then the final project is something impressive" [Alan, ELC].

Melissa, a VTG team member, points out a major drawback to the modular work design approach—the loss of feedback from others not working on a particular project.

> I think before we became so virtual we had more traditional meetings where everybody would just sit around and shoot the breeze about different projects and offer different ideas. Now, it's like a Catch-22 because the roles are so defined only certain people usually are involved in certain projects, so sometimes we lose other peoples' creativity who might not have anything to do with a project, but would see different things outside the dotted line.

To avoid this drawback, many teams used the iterative approach in conjunction with the modular approach.

The Iterative Approach

In the iterative approach, team members engaged in back-and-forth development cycles. Members worked a little, presented those results to the team, got feedback, worked a little more, presented those results, got more feedback, and so on until the project was finalized. E-mail technology allowed team members to throw out their ideas in a more or less random fashion. Ideas could bounce back and forth and build on one another with ease. Although several teams used the iterative approach, mostly in conjunction with the modular approach, two teams, ELC and OfficeTech, used the iterative approach frequently. For example, Richard, an OfficeTech team member, characterizes the team's creative process as a series of steps, alternating between thought and action.

> Ours is more a very iterative close contact. [We] talk about it either via e-mail or via voice as you go along, and brainstorm ideas. One of the keys to our success is, as far as creativity is concerned, this frequent contact between team members. We're trying to do what, in software terms, is sometimes referred to as rapid prototyping, where you think a little, you do a little, you think a little, you do a little, you think a little, you do a little, rather than thinking a whole lot and then trying to come out with something that everybody agrees with the first time.

When To Use Each Work Design Approach

Typically, the most common work design approach used for virtual work is the modular approach. As seen in Table 1.2, seven out of the nine teams I spoke with used this particular approach in completing their work. However, the three work design approaches are not mutually exclusive. Table 1.2 outlines the work design approaches used by the virtual teams I interviewed. Most of the teams used more than one work design approach in accomplishing their work.

Table 1.2 Work Design Approaches Used by Teams When Creating

Team	Work Design Approach
Organizational Consultants:	
Alpha Consulting Incorporated (ACI)	Modular, Iterative
Jacobs/Taylor	Modular, Iterative
Vital Training Group (VTG)	Modular, Iterative
Education Teams:	
Electronic Learning Consortium (ELC)	Modular, Iterative
Job Search Consortium (JSC)	Modular, Iterative
On-line Service Providers:	
OfficeTech	Iterative
WN-Current Events	Modular
WN-Religion Forum	Wheel, Iterative (between team leader and individual members only)
Design Engineers:	
AutoMax	Modular, Iterative

Not every creative effort (or for that matter, less creative effort too) may be easily divided into sections. In those cases, a modular approach may be a poor choice for accomplishing that particular task. Virtual team designers need to consider seriously whether the creative task at hand can be effectively accomplished within the specific work design approach the team is using. Some teams may find it better to adapt a more flexible design, using one work design approach for one situation, and switching to another when the circumstances call for it. You may find Table 1.3 helpful in deciding what work design approach might work best for your team and when.

Table 1.3 Work Design Approaches

Work Design Approach	Works Well When
Wheel: Leader communicates to all team members; individual team members have little interaction with one another.	• Decision-making is centralized. • Leadership is permanent. • Work completed by individual team members does not require a lot of input and feedback from other team members. • Work completed by individual team members does not substantially overlap. • Team leader integrates individual work elements from all team members. • Individual team members have necessary expertise to accomplish their work. • Team members trust their fellow team members' expertise and are willing to let each handle their own work.
Modular: Work is parceled out to qualified team members; elements are integrated together later on.	• Task can be parceled out or divided among team members. Especially useful for creative tasks that can be easily broken down (such as writing a technical document, preparing a client proposal). • Team member roles and responsibilities are clearly defined. • Development work does not require extensive feedback or joint effort among members of the entire team. • Team has access to technology that can allow and support the exchange of shared work. • A democratic decision-making system is in place to support the team's assessment of the creative outcome. • Clearly-defined methods for ensuring accountability are in place and followed to guarantee team members will deliver their work on time. • One team member or support person is responsible for assembling all pieces of the project at the end.

Table 1.3 Work Design Approaches, Cont'd

Work Design Approach	Works Well When
Iterative: Work may be parceled out to qualified team members but members work together in back-and-forth development cycles.	• The nature of the work necessitates more frequent interactive input from and among all members or subsets of the team. • There is sufficient time to go through several back-and-forth development cycles. • Team members are willing to share their work in early stages of development. • Team members give one another honest, constructive, and open feedback. • Team members are accepting of and comfortable with divergent points of view (feedback from other members). • There is a well-designed system for communicating during the creative process. • Team norms support regular and open communication. • Technology is available to support the exchange of shared work.

Assessment Tool: Appraising the Creative Process and Work Design Approach

Now it's time to take a look at the creative process as it unfolds in your own virtual team. Use the questions presented in this section to reflect on and assess the functioning of the creative process within your virtual team and the specific work design approaches your team is using (or should be using). And remember this. By engaging in assessment, your virtual team is really mirroring the creative process as well. (Revisit the guidelines for using chapter assessment tools described in the Introduction if you need to.)

Assessment Questions

Overall Creative Process

1. How would you explain to a new member joining your team how creative results (products, projects, services, other outcomes) are achieved? In other words, how does the creative process evolve in your team? (Having team members share stories about the creative process underlying specific creative results provides insight into commonalties and variations in the creative process across different types of creative efforts.)

2. How do team members currently use linear (structured) approaches in their creative process?
3. What role do insight and intuition play in the team's creative process?

Idea generation

4. Is there a disciplined procedure in place that team members use to scan the environment for possible unmet needs or problems?
5. Is there a forum team members may use to share ideas they find intriguing? In this forum, are ideas initially shared without judgment and evaluation by others?
6. To what degree are team members open to hearing ideas offered by other team members?
7. Is there a disciplined procedure for using specific criteria to evaluate alternative solutions once generated?

Development

8. Is there a system in place for organizing development work (organizing the exchange of working drafts, designs, or prototypes)? How effective is this system? What would you change? What would you not change?
9. Do team members take the time to offer valuable and constructive feedback to one another?

Finalization and closure

10. Is there adequate time set aside to make last minute adjustments and revisions before implementation?
11. Is there a forum where team members can gather consensus on the proposed action before taking action? If so, how effective is the decision-making system that is in place to gain agreement?
12. Is there a system in place for gaining agreement from individuals outside of the team who may be affected by the proposed action?
13. To what degree can team members reach closure within the appropriate timeframe on a particular creative effort?

Evaluation

14. Is there a formal, disciplined process for evaluating action taken?
15. To what degree are multiple criteria used when evaluating action taken?
16. To what degree is feedback from evaluation used to further refine the action taken?

Work design approaches

17. What are the most frequently used work design approaches (wheel, modular, iterative, or others your team may use)?
18. To what degree are projects parceled out to individual team members? How effective is this process (in terms of divvying up the work fairly, assigning sections to those who have appropriate expertise, assigning sections that individuals are motivated to work on, holding team members accountable for delivering results of their individual efforts on time)?
19. To what degree is there a sense of iterative exchange in the development of a creative result? Are forums established for this? If so, how effective are they?

Final Thoughts

There needs to be *an appropriate balance of togetherness and apartness on the path of the creative process.* Although many of the virtual teams I interviewed relied heavily on the modular work design approach, each had their own unique creative cycle in which members oscillated between periods where they would come together (whether electronically or face-to-face) and periods where they would work apart and by themselves. The appropriate balance of togetherness and apartness varied for each team, with some teams (Jacobs/Taylor, JSC) needing more time together to create and other teams preferring time apart (VTG, WN–Religion Forum). Lipnack and Stamps (1997) referred to this oscillation between togetherness and apartness as the "rhythm of aggregation and dispersion," a rhythm they suggested has been around since ancient times. Lipnack and Stamps likened the pulse of virtual teams to foraging societies that survive even today, such as the !Kung of the Kalahari Desert in Botswana.

> There was a pulse to the ancient life of nomads: groups of families came together and then went apart. Foragers had to follow the rhythm of the seasons dictated by their sources of food. Even today, !Kung households move to the same beat which literally 'goes with the flow.' Access to water moves the !Kung through seasonal cycles that cause groups of families to diverge and converge. The !Kung beat holds for the way most people work—coming together and going apart. People work alone and then join up in a group. We do what we do best independently and then work with others to expand our capabilities. The basic social rhythm of human beings has not really changed in two million years. [1997, p. 110]

Thus, these virtual teams worked and created in the same manner as humans have done for ages. However, the technology through which these teams did so has evolved quite considerably. In addition, the leadership structures used to guide virtual teams have also changed from the more traditional autocratic models. Chapter Two outlines the typical leadership structures used by virtual teams and offers some suggestions on how to choose an appropriate leadership structure for your virtual team.

Points to Remember

- Virtual teams follow a path of four stages in their quest toward the production of creative results: idea generation, development, finalization and closure, and evaluation. However, the boundaries between the four stages can become blurred.
- In the creative process of virtual teams, it appears there is more of a push to get to development quickly. Less of an emphasis is placed on sorting through a variety of problem definitions, and more focus is put on assessing whether presented problems are worthy to pursue.
- Three work design approaches guide the work of virtual teams as they proceed from initial idea generation, through development, to finalization and closure, and to evaluation of a creative effort. These approaches are the wheel, modular, and iterative approaches.

- The most common work design approach used by virtual teams during the creative process is the modular approach, in which the work is parceled out or distributed among team members based on their expertise or interest.
- The loss of feedback from others is a disadvantage of the modular approach. To avoid this drawback, many virtual teams use the iterative approach—in which team members engage in back-and-forth development cycles—in conjunction with the modular approach.
- Team members need an appropriate balance of togetherness and apartness as they work toward achieving creative results.