My time or yours? Managing time visions in global virtual teams

Carol Saunders, Craig Van Slyke, and Douglas R. Vogel

Executive Overview

Advances in technology and group-collaboration software have promoted the use of Global Virtual Teams (GVTs). Because of these and other developments, managers face an increasingly diverse cultural landscape. Differences in GVT members’ perceptions of time, or time visions, subtly influence the team’s dynamics and performance. Time visions must be managed in order for the full potential of the GVT to be realized. This article explores the different dimensions that are typically employed when defining time. These dimensions are then combined to form four examples of cultural time visions. Three major problems associated with differing time visions in GVTs are identified, and approaches for dealing with these problems in multicultural GVTs are suggested.

As technology transcends spatial, temporal, and organizational boundaries, Global Virtual Teams (GVTs) are becoming increasingly popular. This popularity is a result of several factors: (1) organizations increasingly rely upon virtual teams to accomplish organizational goals as the knowledge required to solve problems expands beyond the capacity of any single individual; (2) increases in telecommunication bandwidth promote the use of networks that link individuals inside and outside the organization; and (3) advances in collaborative technologies such as groupware make virtual teams increasingly effective for collaborating and decision-making.1 As the popularity of GVTs increases, it becomes more important to understand those factors that affect the way they function. Time is one of those factors.

GVTs can leverage time to their advantage. Performing work asynchronously helps global organizations effectively bridge different time zones so that the teams are productive over more than one work period. For example, London team members of a GVT of software developers at Tandem Services Corporation initially coded the project and transmitted their code each evening to U.S. team members for testing. U.S. members forwarded the code they tested to Tokyo for debugging. London team members started their next day with the code debugged by their Japanese colleagues, and another cycle was initiated.2 This is only one example of how GVTs can increase team-member productivity and reduce development time.

Unfortunately, positioning GVT members across different time zones also extends the workday and creates work delays and coordination difficulties. Normal working hours for one team member may be midnight for another. GVTs may also need to work through coordination difficulties created by national holidays and other slower-paced periods of work in the team members’ different countries. One such slower period is the summer season when vacations frequently occur. In the Northern Hemisphere, summer occurs between June and August, while in the Southern Hemisphere it is between December and February. Thus, GVTs with members in both hemispheres need greater coordination among team members. Unlike more traditional teams, GVTs must coordinate distally separated team members using electronic and computer-mediated communication.

Finally, time works more subtly on GVTs due to different time visions that must be managed in order for the full potential of the team to be realized. Time visions are different perceptions of time across sets of time dimensions. They are based on different ethnic and national orientations about time that affect team-member perceptions of deadlines and team success3 that are described below.
Certain time visions may be more likely to encourage creativity. Yet other time visions, especially in combination, may impede other aspects of GVTs. Thus, it is important, and challenging, to manage time visions to enhance GVT effectiveness across a range of tasks.

Understanding how individuals differ in their perceptions of time requires awareness of different temporal dimensions; these dimensions combine to form an individual’s time vision. In the following section, we discuss several of these dimensions.

**What Is Time?**

Time is an extremely complex concept, as demonstrated by the descriptions of the various time dimensions in Table 1. Each culture develops a dominant conception of time by developing along these dimensions, many of which are interwoven. Merging a number of these dimensions results in four time visions, which we discuss in the next section.

### Differing Time Visions

These various notions of time can help us understand the disparate time visions found in GVTs. Time visions differ across countries, longitudinal status (i.e., Eastern vs. Western), and even latitudinal status (i.e., southern vs. northern cultures). Because of their cultural and religious foundations, time visions clearly can transcend national boundaries. Further, many different time visions can be held by the individual citizens of a single country.

Although our focus is on the cultural aspects of time visions, we recognize that individuals have an innate sense of time that is hidden in the more primitive reaches of their minds. In spite of its omnipresence, time is curiously invisible, taken for granted, and hard to explain. Nonetheless, psychologists have often attempted to map ‘objective’ time to ‘subjective’ time and to find conditions (e.g., fatigue, mental disorders, drugs, etc.) that distort or otherwise affect an individual’s estimation of time. For example, time seems to pass much more quickly when one is having a good time than when...

### Table 1

**Time Factors and Associated Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
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| Continuity         | Continuous—time is viewed as a whole  
Discontinuous—time is viewed as a series of divisible, very small time units strung together and separated by temporal lacunae |
| Homogeneity        | Homogeneous—each second is like another second; for example, a second is the duration of $3,192,631,770$ periods of the radiation that corresponds to the transition between two hyperfine levels in the basic state of the atom of caesium.  
Epochal—units of time differ qualitatively, such as when focusing on events |
| Linearity          | Linear—time is directional and flows from past to present to future  
Cyclical—time is seen in the recurring cycles such as annual seasons, life cycles, or circadian rhythms |
| Dimensionality     | Uni-Dimensional—time flows in one, irreversible direction  
Bi-Directional—movement is forward or backward, as in mathematics and classical physics  
Cyclical—flow is recurrent |
| Abstraction        | Abstract—time is viewed as the medium in which events occur; no reference is made to ‘past,’ ‘present,’ or ‘future’  
Concrete—Not all parts in the sequence of events can be experienced at the same time (e.g., gestation or metamorphosis unfolds over time) |
| Subjectivity       | Objective—time is based upon the oscillations of subatomic particles; is independent of consciousness  
Subjective—time must be experienced; involves an individual’s awareness of a transient state of affairs  
Intersubjective—time involves the agreement of individuals on the meaning of time; must be experienced |
| Long-Term/Short-Term | Long-Term—society values future rewards; the time span of discretion extends far into the future  
Short-Term—society fosters values related to the past and present; time span of discretion focuses on the ‘here’ and ‘now’ |
| Chronicity         | Monochronicity—events are scheduled separately, and only one thing is done at a time  
Polychronicity—multiple activities occur at the same time; transactions are handled together rather than completed separately according to strict schedule. |
one is bored. Relevant individual traits include one’s personal sense of time urgency (i.e., concern with the passage of time) and time perspective (i.e., orientations toward past, present, or future). However, even though individuals’ sense of time is psychologically based, it is refined by participation in society and culture. Thus, it is virtually impossible to separate time from culture at some level. Table 2 offers four common examples of types of time visions that are held by large numbers of people: clock, event, timeless, and harmonic.

**Clock**

American, Anglo-Saxon, Germanic, and Scandinavian countries often hold a clock time vision, or a view of time as a scarce commodity. This time vision draws heavily from the concept of time as linear—a concept that had its birth in the Judaic religion. This view of time also is partially based on Isaac Newton’s view of time as abstract, mathematical, quantifiable, and flowing by itself, independently of man. But, the clock time vision, in contrast to that held by Newton’s classical physics, considers time to be unidimensional, and irreversible. Further, it is often short term and monochronic.

Adopting a clock time vision that is linear and divisible into distinct homogenous units allows one to adopt metaphors of time as a commodity that can be lost, spent, or wasted. This conceptualization of time, sometimes referred to as the economicity of time, is recognized as a significant contributor to the development of the Industrial Revolution. It fostered specialized jobs broken into time units that allowed organizations to pay employees for the time they worked rather than on a piecework basis. With this conceptualization, time is a resource that can be measured and manipulated to make organizations more efficient or productive by shortening the amount of time it takes to complete a given amount of work.

**Event**

An event time vision offers a marked contrast to time as a scarce commodity. An event time vision perceives time as cyclical, continuous (holistic), and epochal. As is often the case when time is viewed as cyclical, time is recurrent. Thus, there would appear to be an unlimited supply of time, and wasting it is not a concern. This time vision is common in Japan where there is a keen sense of the unfolding of time. In Japan, there is an emphasis on passing from one phase of an activity to another, rather than on the total time involved.

Consider, for example, the mandatory, two-minute exchange of business cards between Japanese executives meeting each other for the first time. This time-activity segment marks the beginning of a relationship phase. Many other events are characterized not only by well-defined beginnings and endings, but also by unambiguous phase-switching signals (e.g., cherry blossom viewing, gift-giving routines, sake-drinking sessions, etc.). This concrete, epochal, event-driven, long-term, holistic view of time is consistent with the Japanese love of compartmentalization of procedure, tradition, and ritual. The Japanese compartmentalized view of time is consistent with the monochronic way in which they approach the impersonal, official business side of their lives. However, in their personal lives, when the Japanese look inward, toward themselves and their integrated system of relationships, they tend to be polychronic and long term in their orientation. This culturally based long-term orientation influences how Japanese organizations undertake strategic planning.

**Timeless**

Regions where Hinduism or Buddhism predominates tend to adopt the timeless view of time. Hinduism views the world in terms of simultaneous

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Clock</th>
<th>Event</th>
<th>Timeless</th>
<th>Harmonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity</td>
<td>Discontinuous</td>
<td>Continuous</td>
<td>Continuous</td>
<td>Continuous</td>
</tr>
<tr>
<td>Homogeneity</td>
<td>Homogeneous</td>
<td>Epochal</td>
<td>Epochal</td>
<td>Homogeneous</td>
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<tr>
<td>Linear/Cyclical</td>
<td>Linear</td>
<td>Cyclical</td>
<td>Cyclic</td>
<td>Cyclic</td>
</tr>
<tr>
<td>Direction</td>
<td>Uni-Dimensional</td>
<td>Recurrent</td>
<td>Recurrent</td>
<td>Recurrent</td>
</tr>
<tr>
<td>Abstraction</td>
<td>Abstract</td>
<td>Concrete</td>
<td>Abstract</td>
<td>Concrete</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Relatively Objective</td>
<td>Subjective</td>
<td>Subjective</td>
<td>Intersubjective</td>
</tr>
<tr>
<td>Time Horizon</td>
<td>Short-Term</td>
<td>Long-Term</td>
<td>Long-Term</td>
<td>Long-Term</td>
</tr>
<tr>
<td>Chronicity</td>
<td>Monochronic</td>
<td>Formal—Monochronic; Informal—Polychronic</td>
<td>Polychronic</td>
<td>Monochronic</td>
</tr>
</tbody>
</table>

Table 2
Examples of Time Visions
creation and destruction. In such a world the passage of time is insignificant. The world is seen as timeless, even though time may be viewed as real for trivial tasks like daily chores. Thus, the timelessness of Hinduism is long term, abstract, and epochal. It is also continuous, cyclical, polychronic, and recurrent. Buddhism, which arose from a sixth-century reform movement of Hinduism, is based on a similar concept of timelessness, especially in its view of the soul reaching a timeless state of Nirvana. For Buddhists, only the instantaneous sensation is real, while duration, in contrast, is a construction of the imagination.14 In a Buddhist culture, both life and time go round in a circle: generation follows generation; seasons follow seasons; monsoons, earthquakes and other catastrophes recur; and the sun and moon rise and set day after day. With this time vision, it makes little sense to make a quick decision since opportunities, risks, and dangers eventually reappear when the decision-makers are so many days, weeks, or months wiser. People with a timeless vision may become so engrossed in their work that they are likely to develop and apply creative ideas.15

Harmonic

In contrast to the timelessness of Hinduism and Buddhism, Confucianism and Taoism promote a time vision based on harmony. These latter religious systems that predominate in China and other parts of the world seek temporal harmony within the person, among individuals, and between society and nature.16 Time is very concrete for the Chinese mind, and it is perceived as an aspect of dynamic, living systems that needs to be explored qualitatively. Hence, this time vision is intersubjective since it takes into account the perceptions of others in the society, as well as the individual. Like the event and timeless time visions, it is long term, cyclical, continuous, and recurrent. However, it is also homogeneous to the extent that each second has value and is monochronic in its focus on working on one task at a time. In China, where the harmonic time vision is common, it is customary to thank participants for contributing their valuable time. Punctuality is considered so important that it is not unusual for Chinese to arrive 15 to 30 minutes early for a two-person meeting ‘in order to finish the business before the time appointed for its discussion’ to keep from stealing the other person’s time.17

Time Visions and Organizations

The way that the dimensions of time are combined into time visions depends upon the society and work organization of the individuals holding these time visions. It has been argued that all members of a particular society share a common temporal consciousness, or social time. Social time is a product of society, and the “units of time are often fixed by the rhythm of collective life.”18 The time visions of all individuals are shaped by the society in which they live and refined by the organizations in which they work. Thus, time visions are the product of a social construction about time that varies tremendously between and within societies.

The time visions of all individuals are shaped by the society in which they live and refined by the organizations in which they work.

In modern organizations, social time offers a means of ordering and coordinating activities. Factory and office employees order their work within the parameters and constraints of the workday. The high degree of functional specialization that first emerged during the Industrial Revolution requires the temporal coordination of the many-segmented activities within the organization. Temporal coordination requires planning and predictable schedules. Thus, formal organizations need to schedule activities in time, synchronize functionally specialized, time-segmented activities, and allocate the total amount of time among the total set of activities that need to be performed so as to maximize the organization’s goals/priorities.19

Not surprisingly, organizations adopt a clock time vision to the extent that schedules are developed to make reliable predictions of the points in time at which specific actions will occur and to ensure temporal meshing. Schedules highlight priorities when allocating the scarce temporal resource and synchronizing employee activities. However, conceptualizing time as only objective, linear, homogeneous, and divisible is neither inevitable, culturally universal, nor always desirable. Such an approach may be especially undesirable in GVTs.

Virtual Teams and Time Visions

Like organizations, teams have social time around which their activities are organized. Teams, groups, and subcultures each develop social times that compete with one another in the selection of their society’s dominant time. This article focuses
on the mélange of conflicting time visions found in GVTs. Team members and managers face challenges when trying to reconcile and integrate the members’ different social times. For example, active members of Baha’i and Jewish communities need to reconcile their religious calendar with their secular one. Holidays and practices are based on their religious holidays, while their children’s school timetables and their work schedules are based on secular calendars.20

Do different time visions affect the performance of GVTs? We believe that they do. They create alternate views of scheduling and consequently impact meeting deadlines. They affect synchronizing member activities into an underlying rhythm. Further, the differing visions impact the allocation of resources to the extent that they affect how performance is measured and rewarded. In the following section, we address three issues (i.e., deadlines, rhythms, and performance measures) typically associated with clock time vision and demonstrate how other time visions can be used in managing these issues.

**Scheduling Time: Deadlines**

GVT members who hold a clock time vision view time deadlines in terms of the completion of a series of activities along a timeline. The timelines that they use are divided into intervals with homogeneous units of measure. The needed tasks are performed in a sequence with proscribed milestones. This enables planning using such tools as Gantt or PERT charts. But the focus on deadlines and schedules hampers polychronicity21 or the ability to handle multiple tasks at one time. It also tends to eliminate interpersonal and nontask communication and interactions as team members focus on their assigned task.22 These types of interactions help build a cohesive team identity.

In contrast, a timeless time vision allows a more holistic view of deadlines. With this time vision, neither the time requirements for various activities nor their sequencing is considered. Rather, each activity is epochal and has a value of its own. One finds performing each activity in the present moment to be very wholesome.

When studying GVTs from a clock time vision, Jarvenpaa, et al., found that the most successful virtual teams in their study used their time well and had few purely social exchanges.23 In contrast, it is unlikely that holders of cyclical time visions would be too excited about using their time well. Further, the focus on scheduled production may not be as pronounced when holding a cyclical time vision. Temporary teams rarely exhibit dysfunctional group dynamics, such as dealing with jealousy and hurt feelings, because they do not have enough time to do so.24 They must concentrate on the primary task assigned to their team. But, would someone who does not view time along a timeline but lives in the moment be concerned about completing an assigned task by the deadline set for the temporary virtual team? For example, those who hold a timeless time vision may unintentionally ignore the passing of time if it means that conversations would be left unfinished. They may consider reality of the moment as something that can be molded or stretched, irrespective of schedules. Therefore, one would be unlikely to hear an individual with a timeless, or any cyclical, time vision bemoaning time as wasted, spent, or used.

**Temporary teams rarely exhibit dysfunctional group dynamics, such as dealing with jealousy and hurt feelings, because they do not have enough time to do so.**

**Synchronizing Time: Team Rhythms**

Clock time vision was clearly evident in Gersick’s25 work on punctuated equilibrium, or alternating periods of inertia and activity. Using this perspective, a team’s rhythm develops in response to its deadline. At the midpoint between the starting point of a project and its scheduled completion time, team members transition from preliminary activities to a more hectic pace undertaken to complete the project on time. When viewed from a clock time vision, the team members consider time as linear and divisible. At the halfway point, their actions change to allow them to meet the deadline by effectively pacing and synchronizing their activities. Thus, they synchronize their activities by segmenting time into homogeneous units and temporarily segregating their team’s activities.

Though a clock time vision often predominates in organizations and teams such as those studied by Gersick, time visions that are based on cycles cannot be ignored when looking at a team’s rhythms. Team members need to mesh their individual cycles into a synchronized pattern of activities. To be successful, a GVT needs to establish a rhythm that recognizes the repeating cycles inherent in its tasks or characteristics.26 In one study of GVT’s, the repeating cycles of activity were structured around intense face-to-face meetings. These meetings served as the team’s heartbeat that rhythmically pumped new life into the team’s pro...
cesses. Most team communications occurred around the face-to-face meetings. In between the meetings, team members interacted in response to previous meetings or in anticipation of the next meeting. The beat speeded up when the task became more complex or interdependent and slowed when tasks were unambiguous and roles were well defined.

Toyoda Kiichiro, the founder of Toyota Motor Company, viewed synchronization as the critical aspect of manufacturing efficiency. In order to make production at Toyota more efficient in the 1930s, he purchased the latest and most sophisticated machines. But dramatic increases in efficiency were not realized because each machine completed jobs at a different speed. It was then that Kiichiro designed a just-in-time manufacturing process where each phase was synchronized with every other phase in a smooth coordinated flow. Synchronization took into account the rhythms of the whole production system—humans, machinery, and equipment. Kiichiro’s approach contrasts with the approach used at Ford and other American automobile manufacturing companies which makes manufacturing more efficient by squeezing wasted time from each individual task in the sequence.27 Typically the entire system is not synchronized.

**Approaches to time management based upon accounting practices with a clock time vision are inadequate for understanding project-based team processes.**

**Allocating Time: Performance Measures**

Time visions also play a role in measuring GVT performance. Because a clock vision makes it easier to estimate and account for labor costs, most accounting systems are based on a clock time vision. Time spent on a particular task can be broken into units of time and costed out. With a clock vision, the work of GVTs can be assigned to team members using a rational allocation scheme, and progress can be monitored with completion targets derived from accounting-based guidelines. However, approaches to time management based upon accounting practices with a clock time vision are inadequate for understanding project-based team processes.28 With the clock time vision, work is perceived to follow an orderly, managerially imposed timeline and timetable comprised of discrete, measurable activities with predictable durations, sequencing, and interactions.

However, this is not always the case. For example, an Executive Information Systems (EIS) development project did not always have discrete, measurable activities with predictable durations and sequencing. Rather, project work was often socially organized and characterized by routine activities and unexpected interruptions that both recurred in a cyclical manner. Multiple cycles existed within the project and included daily report updates, weekly team meetings, annual budgeting rounds, and occasional software upgrades. Project members needed to negotiate how these cycles would be handled. Further, since project members were assigned to several different projects, they were often forced to choose among a number of projects as they packed activities into their time-constrained schedules. They actually ended up using a relaxed and informal time management approach rather than one based on detailed time-planning or record-keeping. Thus, an event time vision was much more appropriate for measuring performance with cyclical (but changing) routines, interruptions, and uneven changes in the pace of the project. We believe that like this project, GVTs can benefit from an event time vision, especially when the GVT members are assigned to several different projects at the same time.

**Managing Time Visions**

Each of these issues (i.e., deadlines, rhythms, and performance measures) can be mapped back to management problems experienced around the globe: temporal uncertainty, conflicting temporal interests and requirements, and the inherent scarcity of temporal resources.29 Temporal uncertainty arises from differences in time vision. It also arises from unexpected complications. Scheduling and synchronizing reduce temporal uncertainty to the extent that the starting and ending points can be specified. Thus, scheduling and synchronizing may both be linked to deadlines. Synchronization is the mutual adjustment of various social units. This adjustment reduces conflicts and coordinates activities so that they can be executed smoothly. Understanding and generating the underlying rhythms promote this synchronization. Finally, efficiently matching available time with required activities is the focus of allocation. This requires assigning priorities or values to tasks. The performance measurement system should reflect these priorities or values.

Because team members are separated by time and space, virtual teams, especially global ones, often acutely experience these three problems. We
believe that although time visions cannot easily be changed, they can and should be managed. Some approaches to managing different time visions include:

- creating awareness of the differences,
- facilitating the development of team norms,
- creating an intersubjective time vision,
- matching technology to time visions,
- avoiding time language traps, and
- applying the appropriate measures of performance.

Table 3 applies these approaches to the three problem areas.

**Creating Awareness**

Teams that are unable to manage differences in time visions regarding deadlines may be unable to work well collaboratively. The first step in managing time visions is to make GVT members aware of differences in time visions. For example, if some GVT members with a clock time vision are not aware of the perceptions of other members with an event time vision, they are likely to be frustrated when their team members do not hold deadlines in the same high regard and, consequently, fail to meet them. Team members whose views of time differ markedly from those of their teammates may

<table>
<thead>
<tr>
<th>ISSUE (Associated Problem)</th>
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<tr>
<td>DEADLINES (Temporal uncertainty)</td>
<td>RHYTHMS (Conflicting temporal interests &amp; requirements)</td>
</tr>
<tr>
<td>Creating Awareness</td>
<td>Awareness of differences helps team members understand why some members are not as concerned about deadlines as others, reducing withdrawal behavior.</td>
</tr>
<tr>
<td>Developing Team Norms</td>
<td>Norms on punctuality, attendance, and scheduling help in establishing and meeting deadlines and reducing uncertainty.</td>
</tr>
<tr>
<td>Creating an Intersubjective Time Vision</td>
<td>Team members with clock time vision may be more vocal in proposing and forcing agreement on deadlines.</td>
</tr>
<tr>
<td>Matching Technology to Time Visions</td>
<td>Automated scheduling tools make priorities and deadlines explicit, as well as offering reminders of approaching deadlines.</td>
</tr>
<tr>
<td>Avoiding Time Language Traps</td>
<td>Precise understanding about deadlines and differences in uses of verb tenses and nouns reduces uncertainty.</td>
</tr>
<tr>
<td>Applying Appropriate Performance Measures</td>
<td>Accounting systems need to reflect both deadlines and milestones on a well-defined timeline with individual accountability.</td>
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</table>
exhibit withdrawal behaviors such as low satisfaction, absenteeism, and turnover.\(^3^1\) Becoming aware of differences in time visions helps team members understand the practices and traditions related to alternative time visions, thereby decreasing withdrawal behaviors.

Just as the Myers-Briggs test identifies the cognitive styles of team members, a test could be devised to uncover different time visions. In the absence of such a test, managers may take special pains to watch for and address possible misunderstandings related to different time visions. They could meet privately with employees to bring up time-sensitive issues related to their understanding of deadlines and ways to meet those deadlines. Team members and managers alike could initiate discussions to gain a better understanding of members’ time visions. This is difficult because team members may not be able to articulate—or even know—their time visions. Yet, it can be done. At least one study demonstrated that managers who had worked with team members for some time were able to identify the extent of polychronicity in their subordinates.\(^3^2\) Training may help them identify differing time visions and articulate their own.\(^3^3\)

When imposing deadlines, work times, and physical monitoring, managers should take into account the differing rhythms evolving from the members’ time visions. For instance, effective flight crews adapted to the different temporal perspectives of other crew members during time-constrained, high-workload flight simulations.\(^3^4\) Crew members needed to overcome conflict and reach a consensus about team-level activities before they could jointly adapt to non-routine problems.

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**Facilitating the Development of Team Norms**

Managers of GVTs should avoid viewing cultural diversity as threatening or harmful. Rather, they need to fully appreciate all time visions. In particular, they need to realize that clock time vision prescriptions may not be the most appropriate for all GVTs. Instead, managers must take advantage of different time visions when they are responding to temporal uncertainty, reducing temporal conflicts, and dealing with scarce temporal resources.

Managers who anticipate incongruent time visions among team members can reduce ensuing uncertainty by arranging for them to participate in exercises (for example, brainstorming) that ensure they all have the same time perspective. Managers can also ask a person who is part way between the team members in polychronicity, time horizons, etc., or team members with harmonic time visions, to serve as intermediary at critical points of the team’s development and decision making. Of course, in some cases the differences in time visions may be beneficial to the team. For example, GVTs composed of members with different time visions may be less likely to experience “groupthink.”

GVT leaders should lay the groundwork for developing norms, or unwritten and often implicit rules, about how the team members should interact with one another. Norms are critical in synchronizing the actions of the team members to reduce temporal conflict and in establishing schedules to reduce temporal uncertainty. Without norms, team members would need to coordinate each activity with one or more of their teammates. This coordination becomes more demanding as the size of the team increases. Eventually implicit norms become translated into explicit rules, regulations, and standard operating procedures, with formalized sets of expectations about how team members are supposed to behave in each of their roles.\(^3^5\)

As team members interact to establish team norms concerning the use of information and communication technologies, time vision differences may be highlighted and, hopefully, understood. In particular, norms on punctuality, conferencing etiquette, and scheduling should reflect differences in time vision. Norms should be established concerning telephone, email, and video conferencing etiquette (e.g., warning team members when a person will be out of town, guidelines for returning phone calls, etc.), meeting attendance and scheduling, work to be performed, punctuality, and constructive feedback.\(^3^6\) Development of shared norms is more dynamic and achievable than many would initially suspect.\(^3^7\)

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Considering different time visions may allow GVT managers to use limited resources more effectively. For example, GVT managers may take time visions into account when assigning individuals to teams, or when assigning tasks to individuals within a team (i.e., production-oriented or scheduling tasks may be best assigned to individuals who hold a clock time vision).
Creating Intersubjective Time Vision

Being aware of differences in time vision may not be enough. For example, individuals with cyclical time visions may not only place low priority on completing their tasks in a timely fashion, but they may also be difficult to train to work faster or be more focused on deadlines.\(^3^8\) A view of time as linear and objective may be excellent for tight deadlines and well-organized schedules, but it is at odds with a vision of time as cyclical, epochal, polychronic, and subjective. GVT members cast the tone for their group in their first few message exchanges. This has clear implications for scheduling activities in team projects with specific deadlines. Team members, cognizant of differing time visions, may need to create a team vision of time early in the life of their project. In so doing, the vision will, of necessity, be intersubjective.

In creating an intersubjective time vision, individuals possessing a clock time vision may more actively seek to have the team time vision reflect their personal time vision. Time-urgent individuals who have a heavy focus on meeting deadlines (and who consequently have a linear, monochronic orientation to time) may persuade other team members to perform key tasks in a sequential manner.\(^3^9\) A clock time vision in which the members focus on doing one thing at a time within a scheduled timeline may be especially appropriate for many production tasks. In other situations, however, it may be more efficient for teams working under tight deadlines to form subgroups, divide large tasks into subtasks, and allow the subgroups to perform the subtasks simultaneously.\(^4^0\) Deadlines may need to be relaxed, and loose schedules may need to be employed to adapt to their varying rhythms.

Matching Technology to Time Visions

By definition, virtual teams rely heavily upon information and communications technology. That very technology may help accommodate different time visions:

- Automated scheduling tools, such as GANTT and PERT charts, make team members, especially team members with cyclical time visions, aware of team schedules. An example of this is the prototype of an “operation book” for scheduling surgery in a clinic. The tool is used to plan surgeries, decide upon and administer ad hoc changes for scheduled operations, communicate among clinical staff, and provide information for individual and team planning. The built-in planning function keeps track of the availability of operation theaters and personnel, medical-technical conditions which influence the timing of surgeries, and the compatibility of scheduled operations with personnel’s working hours. Hence the tool promotes synchronization, the allocation of temporal resources, and coping with temporal uncertainty.\(^4^2\)

- For GVT members with monochronic time visions who feel the stress of trying to do two or more things at the same time, technology can be used to reschedule one or more of the conflicting activities. For example, an individual can videotape an event (such as a meeting) so that it can be viewed at the individual’s convenience. Or, asynchronous communication media such as email may be used to defer communication to a later time when the team member is less busy.

- Technology can make work events occur in a more predictable, regular sequence. For example, a new technology increased the monochronicity of radiologists’ work by making the recurring events in their working day more structured and predictable. Further, radiologists and technicians experienced less conflict among themselves when their work patterns were synchronized.\(^4^3\)

Other technological aids for time management can be conjectured: Automated tools for applying critical-path methods can identify a project’s critical path and the possibility of simultaneous performance of tasks by subgroups; group collaboration tools with multi-channeling capabilities can expand the creativity abilities of team members with

Creative tasks may be hampered by over-concern with deadlines.

Creating an intersubjective time vision may be especially important in tasks requiring creativity. Creative tasks may be hampered by over-concern with deadlines. Because of limited attention to resources, the more one’s consciousness focuses on succession, the less attention it invests into the task itself. Full involvement in the task, or timelessness, increases the likelihood of creativity in regard to the task. Thus, for creative tasks, a cyclical time vision may be more desirable, whereas a clock time vision is more appropriate for straightforward production tasks.

All time visions may be highly desirable depending upon the task. Organizations can proactively take advantage of differing time visions to maximally support multi-cultural virtual teams.\(^4^1\)
clock time visions; knowledge-management technologies may encourage GVTs to create shared time visions; collaboration systems and discussion forums are promising technologies for helping members of virtual teams understand each other's time visions, and consequently to move toward a shared, intersubjective time vision for the team; dynamic workflow systems help GVTs deal with differences in time vision, particularly if those systems are adaptive in terms of the time vision underlying the systems' design; and, intelligent agents can be programmed to recognize the different time visions of team members and to perform accordingly.

Avoiding Time Language Traps

Problems are often created through the language traps about time and how that language is used. An objective, linear, clock time vision translates expressed time units into the appropriate action. On the other hand, Chinese employees often view units of time holistically and work to create an intersubjective meaning that extends beyond individual units of time. For example, an American boss in Hong Kong says to an employee “Wait a minute” without giving specific attention to how long that minute might really be but expecting the employee to leave after a short time. The Chinese employee may interpret this instruction literally and wait outside the boss’s office door, not wanting to disturb him or her. This can go on for many minutes to an hour, depending on the circumstances. “Give me a minute” can be confusing to a non-westerner. Whose minute is it to give and who wants (or gets) it? Needless to say, the expression “I'll be with you in a minute” has many interpretations and expectations relative to different time visions. However, these are all metaphors we live by that, in the relative non-ambiguity of a single culture or a shared understanding of that culture, allow us to function effectively. In multi-cultural GVTs, these ambiguous situations relating to the language of time should be avoided. Awareness of the problem is a major step in avoiding time language traps.

Precise language becomes particularly important in conveying expectations about deadlines. A deadline may specify (1) the latest time an activity must start; (2) the time before which an activity may not start; (3) the earliest time an activity may cease; (4) the latest time an activity must be completed; and (5) the precise time an event must start or cease. The meaning of deadlines is conveyed both in the wording and the underlying expectations in the following examples:

If the next bus is due to leave a certain station at 6:03 p.m., this does not so much predict that it will leave at precisely 6:03 as it insures that it won’t leave before that moment and offers a loose prediction that it will leave as soon thereafter as conditions permit. Similarly, if a store says it closes at 5:00 p.m., we expect it to be open at 4:50 but would not be surprised if it had not closed up by 5:01. If a ballgame is scheduled to start at 2 p.m., we would expect to see the opening kickoff by arriving in our seat at 1:59:55 but would not be surprised if it had begun at 2:01. On the other hand, a summons to the boss’s office at 2:00 p.m. probably means that you had better be there at or before 2, although the boss may not be ready to see you until after 2. Starting time for a class, or a work shift, implies arrival at least by that time; and a starting time for a party often means “don’t show up until sometime later than that.”

Of course, the meanings about deadlines vary to an even greater extent when the deadlines are specified in different cultures. For example, in Latin countries, the party begins when the party goers converge—which is often hours after the specified starting time. In other cultures, guests are expected to arrive at the time when the host told them that the party would start.

Finally, the level of detail specified when talking about the future has been linked to improved planning. Managers who use the future perfect tense (i.e., set goals in the future perfect tense; e.g., I will have completed the top five activities on my to-do list) plan more effectively than those who speak in the future tense (I will complete the top five activities on my to-do list). Here the language reflects the way that these managers think about time. Of course, this is an example in English, a language that has 22 simple and continuous verb tenses. Not all languages have similar tenses. For example, the languages of Indonesia and Malaysia have no verb tenses. Rather, time is conveyed through the use of time adverbs (e.g., yesterday) or time indicators (e.g., already).

Temporal uncertainty arises from language differences not only because of varying uses of verb tenses but also from the use (or lack of use) of appropriate nouns. For example, the Nuer tribe in Sudan has words for month and day but not for any unit of time in between. And whereas the seasons are nouns in many languages, the Hopi seasons are treated like adverbs. “The Hopi cannot talk about summer being hot, because summer is the quality hot, just as apple has the quality red. Sum-

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mer and hot are the same! Summer is a condition: hot. There is nothing about summer that suggests it involves time. GVT managers may reduce temporal uncertainty by being aware of language differences in the use of nouns and verbs.

**Applying Appropriate Performance Measures**

Good evaluation and compensation systems motivate task- and team-related behaviors. New evaluation systems may be needed for GVTs to assess both individual contribution to the team and the nature of team performance as a whole. Nandhakumar and Jones found that traditional management accounting approaches with strictly enforced deadlines and individual accountability were too mechanistic to capture the complexity of the process of an executive information system (EIS) project development team. Instead they suggested target cost management applied to the team as a whole, or a team-budget approach. Applying their findings to GVTs, team performance and budget allocation should be reviewed systematically, and team activities should be coordinated using an event or harmonic time vision. A simple accounting approach based on the regular review of an aggregated team budget may have advantages over an individual, project-based approach grounded in a clock time vision.

Organizations may also need to switch between different accounting systems to accommodate different time visions. An example comes from a mountain resort that keeps two sets of accounts: one for its cyclical, seasonal businesses (golfing in summer and skiing in winter) and the other to provide annual financial reports to its parent company, which operates on a regular fiscal year.

GVT managers may also use knowledge of subordinates’ time visions to guide procedures for rewarding performance. Subordinates holding time visions with shorter time orientations may be more responsive to frequent and immediate rewards than those with longer time orientations. Those with longer time orientations may be willing to sustain high levels of job performance if they perceive significant prospects for future rewards.

Finally, GVT managers may wish to consider time-scales when measuring performance. A typical feature for a unit or system is its lifetime, or the duration of a process or of an occurrence. A typical lifetime determines the appropriate time-scale for a system. For a mayfly the time-scale is one day, while a human’s time-scale is approximately 70 years. When using an annual time-scale to assess the efficiency of banks in other parts of the country. However, when using a finer time-scale, the month of July (which is the peak tourist season), the coastal banks were significantly more efficient. Apparently, coastal banks carried some slack over the entire year. While this decreased their efficiency on an annual basis, it allowed the coastal banks to cater to the huge tourist influx in July. Thus, time-scales can help determine what period of time to use in measuring performance.

**GVTs: Challenges and Opportunities**

It is clear that GVTs offer a number of managerial challenges in addition to opportunities. With this article we introduced more subtle issues that plague GVTs. Perceptions of time may be so innate that many managers may not be conscious of their potential to influence GVT performance. But even though the perceptions are innate, managers need to be aware of and respond to underlying value systems based on time visions. Fortunately, steps can be taken to manage diverse time visions in GVTs. Managers and members of GVTs should:

- Create awareness of different time visions among team members
- Facilitate the development of time-related team norms
- Create an intersubjective time vision
- Match information and communication technologies to time visions
- Avoid time language traps
- Apply multiple, appropriate performance measures that reflect sensitivity to differing time visions

Creating awareness among managers about different ways of considering time and its consequences is important for GVT success. Sensitivity to time visions presents many opportunities for productively creating and managing GVTs. Synergism within a multi-time vision GVT can lead to creative ways of dealing with schedules and tensions and generate new ways of addressing complex issues that might not emerge in a GVT with only a single time vision. Many issues about time visions remain to be explored—but, unfortunately, we are out of time.

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Endnotes


8 Waller, et al.

9 Lewis.


12 Hall.


14 Vatsyayan.

15 Mainemelis.

16 Fraser.

17 Lewis.


20 Orlikowski & Yates.


29 McGrath & Rotfeld.


32 Conte, Rizzuto, & Steiner.


35 Hassard.


45 McGrath & Rotchford, 77.

46 Bluedorn & Denhardt.


48 Holl, 37.

49 Nandhakumar & Jones.

50 Orlikowski & Yates.


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