Managing Virtual Teams

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What are Virtual Teams?

We are in the middle of a tremendous reassessment of the world of work as we go forth boldly into the 21st century brought about through the creative use of the Internet. Compare the way we've always done things – would it make a difference in your productivity?

The Way We've Always Done Things
When I work on-site these days, I am constantly bombarded by distractions while trying to get work done that requires intense concentration. The phone rings, some one drops by, a fax comes with the secretary, I'm summoned into unplanned and unscheduled meetings and the day ends with the question so what did I do today?

Today's Reality
Imagine waking up on a beautiful morning at your home in Northeastern Vermont overlooking the Green Mountains. Before you eat breakfast, you go to your office in another part of the building and turn on your computer starting groupware and email programs fetching the day's news and email and schedule.

You have a leisurely breakfast then stroll into the office to see if any crises happened over night and set about working on the new feature for your company's latest project. You send the phones to phonemail and start three glorious uninterrupted hours of work where you can actually accomplish what you set out to do. By the time the kids come home from school you've met today's milestone and started on the next set and can spend some time outside with them and your spouse.

In the evening the kids need homework time and your spouse needs some quiet time so you slip back into your office and call some of your team members about some of the issues that accumulated and put these on the agenda for tomorrow's group meeting.

Does this sound like Science Fiction? It's not. This is similar to what I do currently as a part of a Virtual Software Development Team with members in Vermont, New Hampshire, Colorado, Georgia and California. I have offices in Vermont and Massachusetts and travel between them.

A Virtual team is a group of humans who have a common work objective. They could be part of a large company who are located in separate offices around the globe or a start up where everyone works at individual offices. What they have in common is that they are working on a project but may not be located in physical proximity and must find other ways to communicate, track progress and manage tasks without being able to physically meet regularly.

How do they work?

The effectiveness of a Virtual Team depends like any other kind of organization on the motivation, commitment and talent of it's members. Highly motivated teams can produce extraordinary results, mediocre teams produce so-so results.

> **ANY TEAM WILL ONLY WORK AS WELL AS IT'S LEAST TALENTED MEMBER.**
> *Elizabeth Noble*

Some of the factors in creating and managing a virtual team are:
- ❑ Clear, manageable objectives
- ❑ Commitment to necessary resources (you're going to have more hardware/software resources, more senior people)
- ❑ Talent especially in the management arena – this is no place for despots or tyrants

You will have all the same problems as a traditional project and a few more but you'll get more productivity and more thoughtful work.

A day in the life of a Virtual Team

A pretty typical day has people performing tasks at all hours of the day and night that matches their own work styles. There are agreed upon meeting times where the whole team connects and then there are sporadic messages in and out during the day.

Illustrated below is a pretty typical day in the life of one of the software teams that I've been a part of in the last several years that are aided by technology to keep connected and to get the job done. The team is a software development team producing a Palm application with database components and data exchange capability. As you can notice, people have varying schedules

Time	Linda (Full Time)	Bruce (Full Time)	Dave (Part-time)	Doug (Part-time)
5:30 AM		Email, Action Items		
6:00		Conduit Development		
6:30	Email - Review Bugs			
7:00		Walk the Dogs		
7:30	QA Meeting Teleconference			
8:00	Add new Action items	Venture Captial Discussion		
9:00	Add corrections to latest version of manual	Email	Other Client Project Work	Other Client Project Work
10:00		Conduit Development		
11:00				
12:00 PM				
1:00	Prepare for Meeting			
2:00	Whole Team Teleconference including Bug Triage, Action Item review, general items of interest such as Java SDK bugs, problems, suggestions and other commentary.			
3:00	Work with Marketing and Advertising Consultant	Notes on Meeting added to Officeclip	Other Client Project Work	Other Client Project Work
4:00		Errands and dinner with Significant other		
5:00	Dinner with candidate		Talk to the kids and have dinner	
6:00	Email	Conduit Development, Phone calls Review Action Items	Dinner	Fix Bugs
7:00	Building and testing Installer		Spend some time with family	Develop new feature

8:00				
9:00			Test Newest	
10:00			Build on Palm	
11:00	Sleep perchance to		Has a real life	
12:00AM	Dream	Collapses		

Roles and Responsibilites

Person	Responsibilities
Bruce	Management, Conduit Development, Budget and Finance, Design Specification Writer
Linda	QA, Tech Doc, Operations, Support, groupware, Web Developer, Installer Developer
Dave	Quality Assurance, Palm
Doug	Java Development, Desktop

The team uses email, groupware and the phone to stay in contact and you actually have better access to folks to get questions answered than any other place I've worked.

What tools are there to help you?

As you can see by the typical day, we spend a good deal of time managing tasks, conversations, ideas and issues. We use a web-based groupware tool and we check in with it to see if there's anything new we need to know or do. It's a kind of collective brain dump. We have a bulletin board app where we put things that are future ideas, commentary, lists, etc. We hold action items in a task tracker, we have a bug tracking system, we have a set of group bookmarks.

We also have to check the messages on the phone and email then I can actually settle down and get at least 3 solid hours in the day when I can work on a project without interruptions. This style of work is what I have always dreamed of being part of where I can play full out and give the best I have to give in a project.

The changing face of work is interesting…I stepped off the fast track at a good size pharmaceutical company thinking well I guess that's that – can't do some of the great stuff I used to do because of money but in moving to a virtual corporation I have in fact found more freedom and we've done some really professional stuff but at a much lower cost..

We do a lot of discussion and planning when we need something done and because we want to stretch the dollars in our corporation we take advantage of what is free on the web, we work hard at planning the services we pay for with good project management skills to make sure that we know what we want.

You need to have at minimum the following resources available either in one package or several:

Web-Based Tool	*Features*
Bug Tracking	Some built in workflow is always needed
Task Management	Who, what, when
Calendaring	Public and Private calendars, RSVPs for meetings, attachments
Document Archive	A place to put shared documents

Other Tool
Email
Phonemail

Nice to Have
White board sharing
Video Conferencing

Refer to the Resource List at the end of this paper for a list of products and services that are available.

Who does well in a Virtual Team?

The type of people who thrive in these environments are
- highly self-directed,
- self-actualizing types:
- very senior staff,
- people right out of school because their expectations aren't set
- Brilliant loners who have a track record of successful accomplishments

One of the great things about virtual teams is that many people self-select themselves into and out of the project fairly quickly. I've been very lucky to be on teams with very wise and motivated management. Mistakes in hiring are corrected fairly quickly – usually fast enough to avoid disaster.

Items to look for on a resume of people that will be successful in a virtual team:
- Previous experience of a similar nature
- Successful on time delivery of previous projects
- Increasing technical and managerial responsibility
- Confident attitude with a past history of achievement

You might ask why I included people right out of school when they might be technically not as sophisticated. Sometimes you will find those rare candidates that are highly motivated but unskilled. When you interview them they have previous volunteer or scholastic achievements that speak to a similar level of responsibility – employ them – they are worth their weight in gold for creativity and desire – they will keep the whole team pumped up. The downside is that you will have to manage them more closely.

What type of people wither in this environment?

People that find this kind of environment uncomfortable or don't perform well are those people that:
- Need lots of direction or are very dependent
- Those with performance problems
- People with high need for affiliation and/or stoking
- Some highly social animals
- Those with low self-motivation and discipline problems

You can clearly relate to having had these kinds of folks on previous teams you've worked on – they drag their own performance and that of others down – avoid them if at all possible.

An important issue of hiring and managing is the ability and willingness to let people go that don't work out. For those in large corporations, you must work with the Human Resource guidelines and with your management and address performance issues immediately – many a great team has been destroyed by one person's problems.

What are the benefits?

Virtual teams may be the only way you can get extremely talented individuals who have scheduling or other commitment conflicts. You have to get good at really understanding reality based scheduling. Hope and Optimist can't play a role in the question "Can this person do this job in this time frame?"

Some of the main benefits are:
- ❑ Cost
- ❑ Productivity
- ❑ Time-to-Market

Cost – Particularly for large companies this may mediate the problem of having to move two career families and may help avert talent loss.

> Example- Relocation: If a person lives in Vermont that has the perfect set of skills and great track record but has no desire to move to the very pricey Boston suburbs and you're working on a project that can be broken up. You have a candidate for a virtual team. The company saves relocation expenses, gain necessary expertise and doesn't have to expand their current office space to accommodate.

> Example – Start up: One team I worked on was in a very hot market area and most of their talent came from the west coast and were on Angel investing. They needed Java programmers and people familiar with Palm development. You can't get office space reasonably in Silicon Valley so a management decision to keep expenses low to get a solid product out without compromising quality was to form a virtual team with members in Colorado, New Hampshire, Vermont, Masssachusetts and California. There was no brick and mortar corporate office

Productivity -Things change as we go through life, we take on a family, buy a house, make choices and we love what we do but need to balance personal responsibility with work responsibility. By forming virtual teams, you are able to retain high perfomers even though their lives may change in terms of personal responsibility.

The important thing is to match skills and availability to necessary tasks.

> Example: A highly skilled developer has recently had a baby and has chosen to stay home but loves the company and the technology. Negotiate how much time she can commit and craft a place on her former team.

Time to Market - A word of caution on this benefit which I hear all the time, "if someone is working at home they'll work more hours". This is a fallacy..

> Don't schedule anyone for more than 80% of a 40 hour week. *If you get more than that count your blessings.*

The fastest way to market is through good planning and scheduling – period, end of story. Why it seems like you get to market faster is you spend less non-productive time (less phone ringing, less cubicle noise, less drop in visitors) and that contributes to on-time delivery.

Remember 60% of all projects fail – don't be one of them – plan, plan, plan.

What are the risks?

You have all the typical schedule and projects risks that Steve McConnell speaks so eloquently on[1]:

- ✓ Feature creep
- ✓ Requirements or developer gold plating
- ✓ Shortchanged quality
- ✓ Overly optimistic schedules
- ✓ Inadequate design
- ✓ Silver bullet syndrome
- ✓ Research oriented development
- ✓ Weak personnel
- ✓ Contractor failure
- ✓ Friction between developers and customers

And there are some additional risks in Virtual Teams:

- ✓ Communication Break Down
- ✓ Inadequate Resources
- ✓ Technology Failure

How do you manage people you can't see?

This is where the art and science blend together as one. You need highly motivated managers who truly feel gratified when other people are brilliant. Egotists fail about the second or third week on the job. My favorite description of management come from Tom DeMarco[2]:

Management is a set of <u>catalytic</u> activities that enable people to work productively and happily. Like a catalyst in chemistry, the manager's contribution is not itself transformed into product, but is its entirely necessary for the transformation of other's efforts into product.

The kind of work we do in computer science is sometimes a very solitary activity but it also requires collaboration so the teams I've been part of trying to balance – thinking time with group time.

We practice a lot of asynchronous thinking. You have an idea but you need thoughts of others on it so you note it in our groupware and keep going with your primary task. If it's really important, you pick up the phone and clarify things. This goes back to the style of the people on the team – everyone doesn't have to be the same but you need people with enough assertiveness to be able to clarify issues they don't understand.

Some of the keys to managing any project still apply but are absolutely essential in Virtual Teams where you can't just stroll into someone's office:

1. Create small (less than 5 day), doable and measureable tasks
2. Review them every few days
3. Take corrective action promptly
4. Communicate frequently and well

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[1] Steve McConnell, *Rapid Development*
[2] Tom DeMarco, *Why does Software Cost so Much?, p. 81*

5. Keep the vision in front of you

Some great courses on scheduling and goal setting are listed in the resource list at the end of this paper.

What are some of the problems?

We've had the usual problems of any project – wrong person in the wrong job, do we have the right talent set, is there money enough in the budget to do what we propose?

We have technology problems – the web is never fast enough, server go down, products we buy don't do what they say they will.

The only problem we have that is related to distance is interpersonal conflicts. These some time have to be solved by getting on a plane and talking to the person in body.

In past situations, where I've worked remotely, one of the biggest problems you have to wrestle with is cultural/political. There are some folks who have management positions who truly believe that the only way people get something done is by putting the lash to their back and thus if they don't see you, you must not be doing your work. To get around this in a large corporation you will need to have a champion who can be your eyes and ears and defender. It also helps if you do something tangible every week – a report, a prototype, etc. because then people will get the impression that gee, that team is really cranking.

How do you fix the problems?

1. Communicate, Communicate, Communicate. When any project goes off track, it is because of a collision of assumption and specification. English (and any other language) is imperfect at best to convey an idea that one person has to another – sometimes you have to show people what you want and that gets tricky – you have to do a lot of prototyping and discussion.
2. Come to closure on decisions and document the why.
3. Create doable and measureable tasks and stick to them.
4. Let Go! Sometimes you can't control all factors and you just have to assess where you are and move on – whether it's with people, tasks, technology, etc.

Is it worth it?

A resounding YES!!! My anectdotal advice is definitely worth considering – I have been a QA, Tech. Writer or Manager for most of my career and the code I work with in the Virtual team is of a higher quality (i.e. fewer defects), we catch them sooner (making them cheaper to fix) because the people creating the code have a different type of work area in which to actually concentrate.

Resources

Groupware Lists and Evaluations

This page is intended to be as comprehensive an index as possible for CSCW & Groupware resources. Use the links at the lower-left to browse to individual topics, or just scroll down the page.
http://www.usabilityfirst.com/cscw.html

Conferencing Conferencing Software for the Web, *A comprehensive guide to software that powers discussions on the Web by* **David R. Woolley**
http://thinkofit.com/webconf/

This site has an introduction to groupware and list of groupware,
http://www.nwfusion.com/netresources/groupware.html

The Virtual Companion http://www.ntlf.com/html/sf/gwlinks.htm

A great site that lists products needed by Virtual teams and e-business:

http://ipw.internet.com/e-business/groupware/index.html

All in One Packages to support Virtual Teams

www.Officeclip.com
www.ProjectPlace.com

Management and Scheduling

Steve Rakitin teaches a great course on Predictable Software Development and a course on Scheduling using the Yellow Sticky Method. Go to http://www.swqual.com/ for more details.

Johanna Rothman teaches several courses such as the Manager's Toolbox and how to be more effective in a management role. More information an be found at http://www.jrothman.com/

Groupware and Organizational Learning
http://world.std.com/~rkarash/GW-OL/

Peopleware, Tim Lister and Tom DeMarco
Why Does Software Cost So Much? Tom DeMarco
Rapid Development, Steve McConnell
Relentless Application Development, Marco Ocana and Linda McInnis

Tool Checklist

To help you decide on what tool to use.

Vendor Name/URL						
Cost						
Discussion Groups						
Group Scheduling						
Reminders						
RSVPs						
Project Scheduling						
Document Archive						
Action Item list						
Bug Tracking						
HR features						
Candidate Tracking						
CRM features						
Time and Expenses Tracking						
Room Reservations						
Cost						
What is it based on? SQL, Notes?						
Group Bookmarks						
How much disk space allotted?						
Free email accounts						

Linda McInnis

Linda McInnis is a Vice President of Engineering for Noble Associates, Inc. In this capacity, Ms. McInnis has built departments and been an individual contributor for companies in Quality Assurance, Technical Documentation, Release Engineering, Data Operations, and Y2K. She has twenty years of industry experience in these areas both as a consultant, and as an individual and managerial contributor. She is the author of several Software Development Process models and many articles on how to develop software test and deploy it. She has also written over 100 technical manuals, white papers, and organizational, process and marketing documents.

Ms. McInnis holds a B. S. in Physics from Worcester Polytechnic Institute and has pursued graduate study in Electrical Engineering at Stanford University. She is currently listed in *Who's Who in the East* and *Who's Who of Business Leaders* and is a member of the ACM and IEEE societies. Ms. McInnis also won Best Paper Award at SM/ASM2000 for her paper *Relentless Application Development*.

She was recently elected Chair for the Boston SPIN (Software Process Improvement Network) for the 2000-2001 term. Currently she is part of a Virtual Team of Developers.