High Performance IT Projects Using Virtual Teams

A Research Insight from AXEN and itmWEB

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From centralized to virtual…

Globalization continues to open up opportunities for organizations to increase efficiency and drive productivity through executing projects remotely and working with geographically distributed teams. This is no more apparent in any part of the business than in the area of Information Technology (IT). Information technology groups are consistently executing projects in multiple geographical locations, both within the organization, and externally with vendors and partners around the world.

This trend toward utilizing more virtual teams is changing the role of CIOs, IT Directors, and IT Project Managers to require more expertise in managing geographically distributed teams. Regardless of whether an IT project is being executed across the city or across the globe from the organization's IT headquarters, today's IT leader is required to have an in-depth understanding of the methodologies, tools, and best practices related to remotely executing projects. For instance, how does one create synergy among workers in different time zones as they would those working in their IT headquarters? How does one manage the risks brought on by these new challenges and ensure that their project is a success?

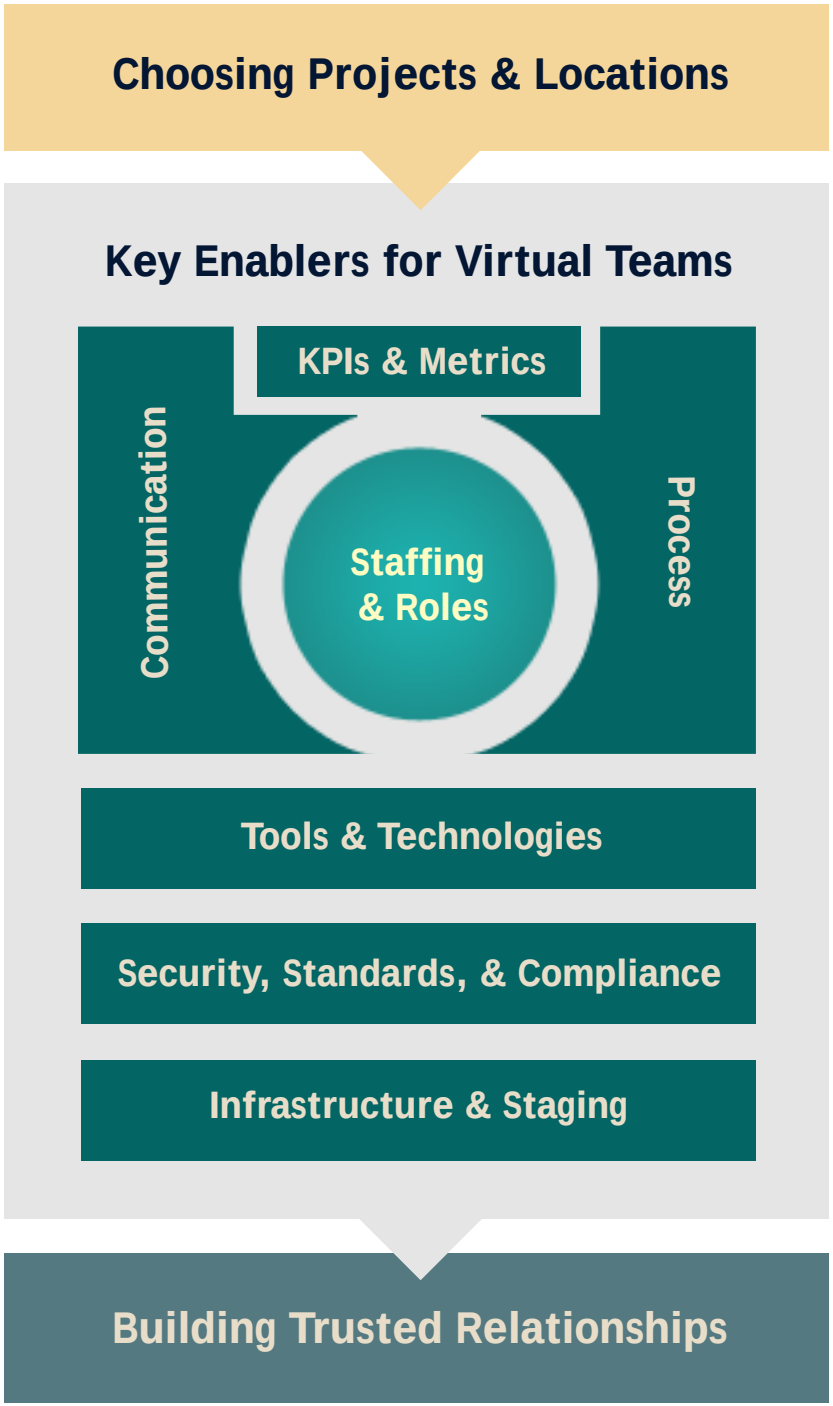
The shift towards remotely executing systems integration and application development projects is driven by the business need for software to be created faster, cheaper, and better than ever. IT outsourcing markets have matured, and organizations understand the cost and scaling advantages that can be gained by working with vendors from outside of the IT headquarters.

Also, technology allows IT workers within an organization to work remotely while collaborating at a high level. However, business leaders and customers have little patience for an IT project being completed late or with defects because of problems attributed to the software development team being off-site.

Another driver is that the rise of emerging countries is generating high quality IT talent around the world. A single project may involve staff from the IT headquarters, business leaders from across the U.S., and programmers in Asia, Eastern Europe, and Latin America. Each group may be accustomed to working within a specific methodology or with certain technological tools. However, synergy must be achieved to make the project a success.

In summary, the skills required of information technology management are changing and expert knowledge is required to properly execute systems integration and development projects remotely. It is more important than ever to cultivate proficiency in managing these projects and using them to bring value to the IT department and the organization as a whole.

This guide will help you in making the right decisions for your organization to achieve the most value from working through virtual teams for IT projects.



The High Performance Virtual Team (HPVT) Enablement Framework

How do high performance companies select, plan, and execute projects utilizing virtual teams with repeatable success?

We discovered nine fundamental virtual team "enablers" which combined together create a foundation for high performance. These enablers support increased communication, collaboration, and trust. The diagram shows the interactive nature of the enablers and how they interact to create a powerful framework for success.

High Performance Virtual Team (HPVT) Enablement Framework Enablers:

- Choosing projects & locations
- Staffing the team and defining key roles
- Establishing security, standards & compliance
- Choosing the methodology & process
- Choosing project metrics & status reports
- Maintaining a high level of communication
- Utilizing technology & tools
- Setting up infrastructure & staging
- Building a trusted relationship

Choosing Projects & Locations

Making decisions regarding the types of projects which will be executed through a remote team is one of the fundamental considerations of virtual project success. We surveyed and interviewed IT executives in order to learn about the kinds of projects they were executing remotely as well as to understand many of their best practice suggestions.

We found that custom development and package customization and configuration projects are the most suitable choices for virtual teams

When asked what kinds of integration and development project types are best suited to be developed through virtual teams, 72% of respondents indicated that custom software development is well suited for remote execution. We believe this is because these project types are moderately lower risk and can be more easily definable, making it easier to eliminate ambiguity with in the requirements.

In the majority of single site companies we interviewed, the most important driving factors for utilizing outside providers in a virtual setting were speed to resource and realization of cost savings

This conclusion was not that surprising to us since single site companies are not that virtualized in the first place, and the introduction of remote teams can be perceived as a higher risk for a positive outcome compared to using centrally located internal resources. However, competitive pressures stemming from a desire for lower costs or the need for outside expertise still drive these more conservative operations to establish virtual teams through outside providers.

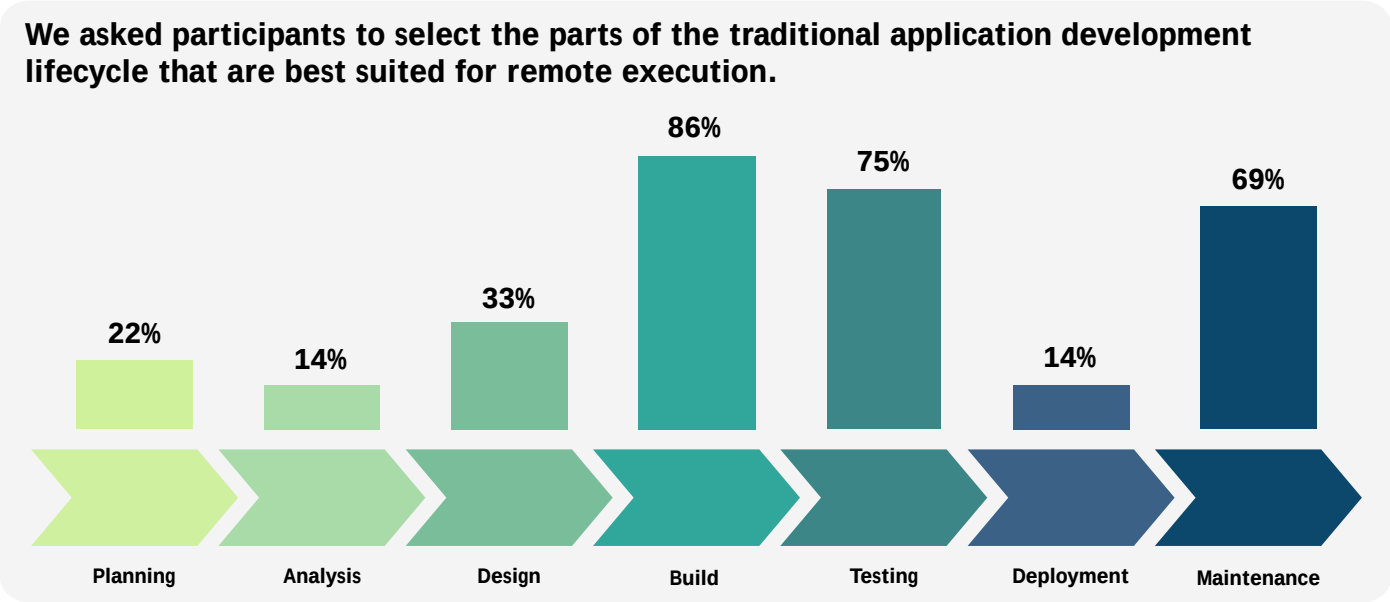
Thinking through a strategy for positioning resources into dispersed geographies can be important for specific types of support situations

One company we studied observed that it is harder to "light up" a virtual team for immediate response to an emergency situation involving support, yet another mentioned that it can be easier to get a solution working immediately by activating a team in an earlier time zone to work on an urgent problem.

We asked participants to rank what is most important about the city or country where the remote team resides.

The research has pointed out that the phases of the traditional software development lifecycle most likely to utilize a virtual team are Construction and Testing

The requirements definition, design, and deployment phases require a closer and more ongoing communication with the geographically located business users and therefore these phases can be potentially more difficult to execute through a virtual team.



Staffing the Team and Defining Roles

This is the first and most fundamental of the enablers that we found for building successful virtual teams. Throughout our interviews we heard about the compelling need to pick the proper team members and to define their roles with clarity and purpose in order to build a foundation for cooperation and success.

Everything rises and falls on leadership and face time

Strong leadership is important in any development project, but its importance is magnified when working with a virtual team. Our respondents pointed out that leading a virtual endeavor requires both the ability to understand the challenges and strengths of each location and the discipline to bring those advantages to light in a way that builds trust and synergy among the entire distributed team.

In order to best facilitate the relationships among the team, we often heard that the remote project leaders should have adequate and frequent opportunities to have face-to-face time with the headquarters leadership and staff. This builds the relationships which are fundamental to a high functioning virtual operation.

In addition, many of our study groups reported that the key remote team leadership members should always be made to feel as though they are a core part of the decision and execution team. This seems like common sense, and it is, but we heard over and over again how fundamental creating regular face-to-face encounters can be to fostering remote project execution success.

Establish a clear leadership role for each location and create a well understood chain of command between all locations

Our respondents pointed out that by designating a named individual at each location to be the key point of contact and representative facing out to the other off-site team members can greatly reduce the chances of incomplete communications and misunderstandings. This point of contact role was often filled by people who were part of quality assurance or business analysis, and for the more infrastructure related efforts we found a technical lead was most often utilized.

Creating a clear chain of command throughout all of the locations improves project execution in multiple ways. From a practical perspective, remote employees need to understand company hierarchy and who the stakeholders are to prioritize and communicate effectively. From a human perspective, having a clear path of leadership and possible advancement within their organization motives the best employees and provides them with an attainable goal for which to strive.

Utilizing virtual teams can be a powerful tool to expand the organization's potential talent pool and maximize resource retention

We are living in an increasingly virtual world, and we heard from many companies experienced in remote project execution that the use of these techniques can magnify the skill and depth of their workforce members by allowing talented resources to participate on a virtual basis. These extended workforce structures were cited by more than one participant as a way to retain great talent in the field and to improve retention by creating and adding them to inclusive and empowered virtual teams.

Have a backup plan if a key individual from the remote team leaves the project

In situations where remote teams were working on highly mission critical projects, one best practice we found was insuring that key team members were informally shadowed by a backup team member should a turnover situation occur. As an alternative, some companies utilized a formalized "ramp up" process to refill the critical role in the event of a team member vacancy. In either case it is important to fully think through the actions which will be taken ahead of time so that the virtual team is prepared if a turnover situation were to take place.

Have expertise in quality assurance at each location

Traditional thought is that quality assurance is managed solely by the remote team doing the development. However, we discovered through our interviews that sometimes having an additional element of QA at the headquarters reportedly can positively impact the number of change requests and defects after deployment.

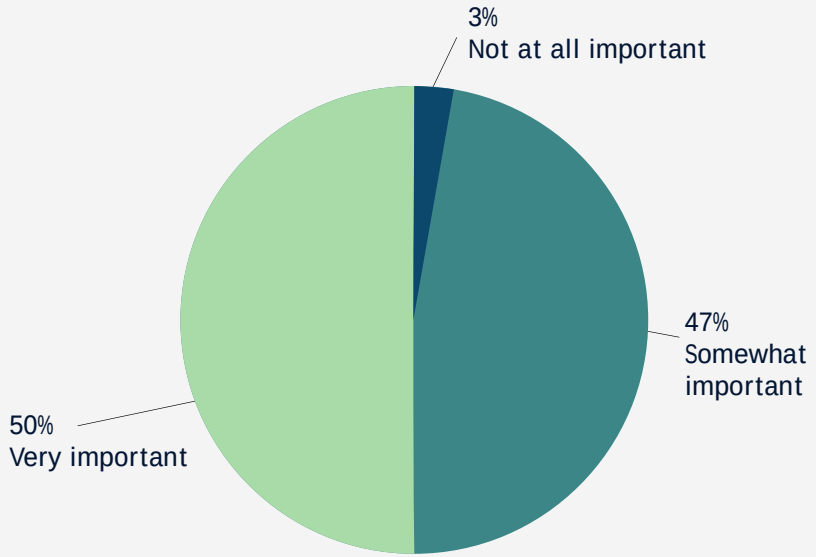
Creating a visual representation of the relationships between team members can sometimes be helpful for optimizing the virtual organization and for facilitating direct communication

We found this was especially true as projects and team members became less centralized and more spread out over time. Having a visual depiction of the people, roles, and channels of communication was cited by several organizations

as providing a type of communication and issue resolution roadmap which gave the ability to see the actual topology and positioning of the remote team members. This was identified as a powerful tool with the most impact in situations where the teams were very large and complex.

If you have PMO interacting with teams on a virtual basis make sure its members have past experience with executing projects through virtual teams

We asked participants how important it is that the Project Manager has prior experience with remotely executed projects when working through virtual teams.



97% of respondents indicated that it is important for the PMO to have prior experience working through virtual teams.

Security, Standards & Compliance

Having a solidly defined framework of guidelines for security, standards, and compliance was the next powerful enabler we discovered for building a successful foundation to support a virtual team approach. We learned that not only does the team gain efficiency by having work method clarity, but also the environment for the virtual team interaction and connectivity becomes well understood.

Our respondents identified two suggested best practices for enabling efficiency and security in a virtual working environment

1. Implement a mechanism for VPN or remote desktop so the members of the remote team connect securely to the centralized development environment. In order to make this possible, the IT headquarters has to prepare a staging environment where all the activities related to the project are performed. This environment should be monitored and controlled for user authentication and authorization.

2. Have the remote team create or host its own staging environment that replicates the primary system of interest. The remote team will have to provide secured access to the users from the IT headquarters to perform reviews and testing. The IT headquarters should have some type of control over the remote environment to guarantee that their business data and processes remain safe.

A second important consideration is that all compliance practices are shared with the remote team and enforced for future audit purposes

This is especially important for organizations where standards have been set-up in order to support SOX type legal requirements within their operating countries. We also found that similar practices apply to supporting ITIL type approaches which may not actually be regulated, but create a unified business process across the virtual team.

Methodology & Process

The approach used for doing the actual work across a virtual team was of very high importance for the companies we interviewed. This was especially emphasized by the teams we studied which were doing development activities.

Waterfall, Iterative, or Agile?

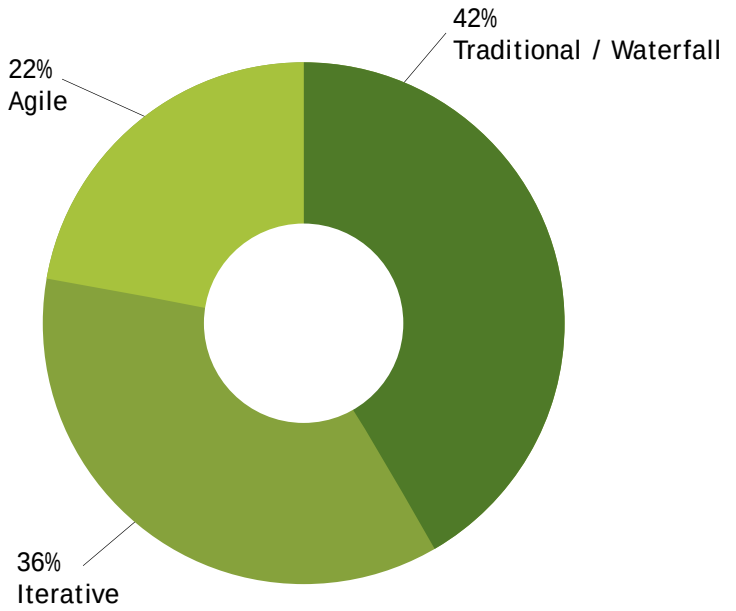
We found that there is really no one-size-fits-all methodology for remote execution of IT projects. The maturity of an organization in their use of remote execution is the most important deciding factor in the best approach. Also, the project type has important implications on this decision.

We found some companies using a mixture of techniques form various increasingly iterative methodologies in order to gain from the strengths of the defined approaches. We also observed that it is important to analyze how prepared the organization is in terms of remote execution before applying a particular methodology.

The companies we interviewed recommended that if an organization does not have a lot of experience with virtual teams the best way to proceed is probably through a more traditional waterfall approach. However, if the organization is experienced with virtual teams and collaborating across geographical boundaries, a more iterative approach like Agile or SCRUM may be used to create faster delivery releases and to drive out detailed requirements during each of the defined sprints.

One company noted that the use of agile actually reduced risk considerably in their situation because misinterpretations of requirements were discovered and fixed much earlier before the errors had a chance to be built into the delivered code.

We asked participants which development approach is best suited for remotely executing a systems integration or custom development project.



Standardize the methodology, documentation, and processes across all the virtual team locations

Regardless of the processes that are being followed, standardizing methods across all geographies helps each location's team to understand exactly what is expected and what will be delivered. All of the organizations we studied made a point of noting this best practice as one of the core enablers of virtual team success.

Predefined documentation and artifact templates were also identified as a key component for boosting the productivity of a virtual team.

Include the remote team in the planning, scheduling, and work estimating in order to gain buy-in and commitment

Several participants highlighted that the practice of dictating schedules from the IT headquarters without input or consensus from the remote team can have negative effects on moral and productivity. Although the remote team may not immediately reject the plan given to them by the IT headquarters, if they do not think the schedule is feasible, they may be less motivated to adhere to it since they had no input.

Also, certain cultures have nuances in the way they communicate which may appear to signal buy-in to the IT headquarters when their acceptance is not really the case. The best way we heard in order to gain the full team commitment was to allow full virtual team member input across all geographical boundaries on work plans from the very beginning.

We found that in certain situations pair programming was used to encourage higher collaboration among virtual teams

Pair programming is an agile software development technique in which two programmers work together at one workstation. One programmer, the driver, writes code while the other, the observer or navigator, reviews each line of code as it is typed. The two programmers switch roles often.

While reviewing, the observer also considers the "strategic" direction of the work, coming up with ideas for improvements and likely future problems to address. This frees the driver to focus all of his or her attention on the "tactical" aspects of completing the current task, using the observer as a safety net and guide.

Pairing can be implemented with a virtual team through the use of audio, instant messaging, and screen sharing. The benefits are improved quality of code, knowledge sharing, and teamwork when tackling tough problems. Some efficiency will be lost by placing two developers onto one task; however, the extra time spent during development is usually gained back during testing and debugging.

Project Metrics & Status

Monitoring project status is also one of the fundamental enablers that we found for supporting virtual team high performance.

The variations of KPIs we found in use by virtual teams covered a wide range of techniques and approaches. The common drivers we found for selecting KPIs at a company were really based on the three factors: the wider business preference, the experience and comfort with the metric, and the maturity of the organization in doing monitoring.

The most important KPIs we found in our study (ranked by common usage)

1. Real Progress
2. Budget Performance Index (BPI)
3. Percent Requirement Compliance
4. Schedule Performance Index (SPI)
5. Traditional On-Time, On-Budget Reporting
6. Resource Utilization
7. Earned Value

The rule of thumb for metrics seemed to be to simply find KPIs that work well for the wider organization and use those same KPIs for all of the virtual teams

In choosing KPIs to use for virtual team monitoring, our observation was that more impact can be derived from KPIs that provide early warning to problems such as: resource shortages, schedule issues, requirements misunderstandings, funding shortages, and value realization. The KPIs that are used across various virtual teams should be equivalent and fairly comparable as a best practice for monitoring.

Characteristics of a good status report

Although the specific items reported are different for each project, based on the feedback we received a good status report should attempt to answer the following questions:

- Where are we standing in terms of budget and timeline?
- What risks do you anticipate?
- What have you accomplished since last status report?
- What problems did you encounter?
- What did you do about them?
- What are you going to do next?

Communication

Clearly in our study, communication best practices were cited time and time again as a vital enabler of high performance. These observations drove out several components of good communication practices; some were based on rituals and routines, and others we based on the human side of communicating.

Requirements communication & understanding has to be taken to an even higher level for a virtual team

Since the clear understanding of requirements is essential for virtual team's success, the requirements documents should be clearly written, highly communicated, easily visible, and universally understood. Clear communication of these requirements is highly important for any project's success, but when working through a virtual team it has the potential to become the Achilles heel of a virtual effort if it is not properly implemented.

In addition, "over communicating" seems to be the standard rule among the better virtual teams we studied. This was even truer when teams were moving from waterfall approaches to agile methods. The frequency of communication increased as the iterative nature of the project increased, but in all cases the clarity of the written documentation played an important role in supporting the remote team activities.

Build in formal touch points among virtual teams along with the regular informal communications

We found that virtual teams are very calendar driven and that conference calls and formal status meetings help to drive the team toward their deadlines even more than a formal work plan. Because of this, a higher performing virtual team will probably build into their process a more frequent number of formalized touch points with the IT headquarters in order to keep the engagement and motivation at optimized levels in the field.

When possible share the pain of time zones

A consensus among almost every IT leader we interviewed was not to require the entire global team to work to the local team's schedule all of the time.

Certain situations do not allow flexibility in this area, but a best practice is to adjust working hours for all time zones and respect personal time. The executives we interviewed who were willing to compromise - along with their teams - to schedule meetings and collaboration sessions according to both the headquarters hours and the remote team's hours reported much more improved communication and collaboration among virtual teams.

When crossing international boundaries consider cultural difference in communication

When collaborating with a global team, our participants suggested keeping in mind that different cultures communicate, think, and work differently. Slight nuances in communication can create large misunderstandings. We heard various ideas for strengthening cultural connectivity including basic language learning, cultural awareness training, and employee exchanges.

Technology & Tools

In today's world an abundance of tools exist which can support virtual teams which operate across every country on the planet. Our study groups had virtual team members which operated in multiple countries across wide geographic boundaries. The common theme we found was that tools and technology are an essential enabler of virtual team existence and success.

Based on our interviews and surveys here are some important tool categories to consider:

Communication Tool Examples

- Email
- Conference Calls
- IM/Chat
- Web & Video Conferencing (Lync, Skype, WebEx)

Some Considerations:

We found that the most widely used and highly valued communication tool was a robust and reliable conference calling and screen sharing capability.

The ability to immediately communicate with team members through instant messaging created a more real-time collaboration experience.

A presence indicator was helpful for quickly finding available resources throughout the virtual team.

Collaboration Tool Examples

- SharePoint, Basecamp
- Yammer, Jive
- Dropbox, Google Docs
- Wikis

Some Considerations:

Identify tools which allow for the creation of standardized project spaces and taxonomies that can provide a knowledge repository for the virtual team.

Select technologies that aid in the team's adherence to common and repeatable development and support processes.

Pick products that encourage artifact use, sharing, and reutilization from one virtual project to the next.

Scheduling & Project Management Tool Examples

- Shared calendars
- PM Software

Some Considerations:

These tools are rapidly evolving into cloud based offerings supported by a variety of devices – take a look into the cloud for some of the more advanced real time management tracking SaaS websites and smartphone apps which provide a more real time status and monitoring experience.

Much more value can be realized from these tools through the participation of all team members and the alignment of the tool functionality to a standard process. Some of the organizations we studied had identified management tool usage recommendations by role.

Application Lifecycle Management Tool Examples

- Version One
- Rally
- Github
- Team Foundation Server (TFS)
- IBM Rational
- Jira

Some Considerations:

Application lifecycle management tools may encompass many of the functions already listed above, but they can also provide a more comprehensive platform focused specifically on software development activities.

Infrastructure & Staging

The creation of a suitable platform for virtual teams to utilize when programming was another key enabler identified within our study. The organizations we spoke with pointed out the make-or-break nature of the infrastructure selection decisions as well as the defined staging processes which were put into place to support programming efforts.

Use mirroring of environments if possible at the home and remote sites

Some of the companies we studied recommended having the same working environments on both sides of the virtual divide. This can result in the creation of a partially remote staging environment with the development component residing with the remote team and the testing and production environments residing at the headquarters or in a private cloud.

Use virtual environments to bring up and take down infrastructures in an on-demand fashion

Several companies highlighted the use of virtualization in order to facilitate the enablement of development environments for the purposes of development and testing. This practice speeds up the process of staging and at the same time isolates each environment to guarantee integrity during the different phases of the project.

Spin up a copy of the target system in a local development environment if possible for specific prototyping programming and testing

This can be greatly beneficial for a remote team because it guarantees that the team is doing their development and testing with the real data, components, versions, and configurations that exist in the current productive environment used by the headquarters.

Establish a VPN for virtual team access

This capability creates an access path for the remote team to connect directly to the environment established for development and testing at the headquarters or within a private cloud. The decision whether to use a VPN will depend on the security practices and policies currently in place at the headquarters.

Building a Trusted Relationship

Our final identified enabler was the human aspect of virtual teams which is the building of strong relationships among the team members in order to encourage trust and cooperation. This was a core tenant which was identified by all of our study participants. In addition, all of executives we interviewed identified trusted relationships as a primary focus of their leadership efforts. Listed below are some of their suggestions.

Make goal alignment and buy-in throughout the virtual team a key executive focus

Highly productive teams have a sense of ownership and belonging throughout the virtual team. Involve them in the planning through all phases of a virtual effort. Sometimes a remote team can feel "railroaded" into an unrealistic schedule; avoid this situation if at all possible. Virtual team members need to feel a genuine sense of ownership of their own schedules which they have developed within their own constrains, abilities, and environment.

Realize that virtual teams are based on relationships and that relationships are strengthened through face-to-face encounters

The successful teams that we studied all built in opportunities for team members to meet in person. This suggestion was made by everyone who participated in this study. The executives we interviewed made the case that a strong correlation exists between virtual team high performance and the face-to-face opportunities experienced by the team. More is clearly better.

Build into your plans and budgets opportunities for virtual team member cross-site travel

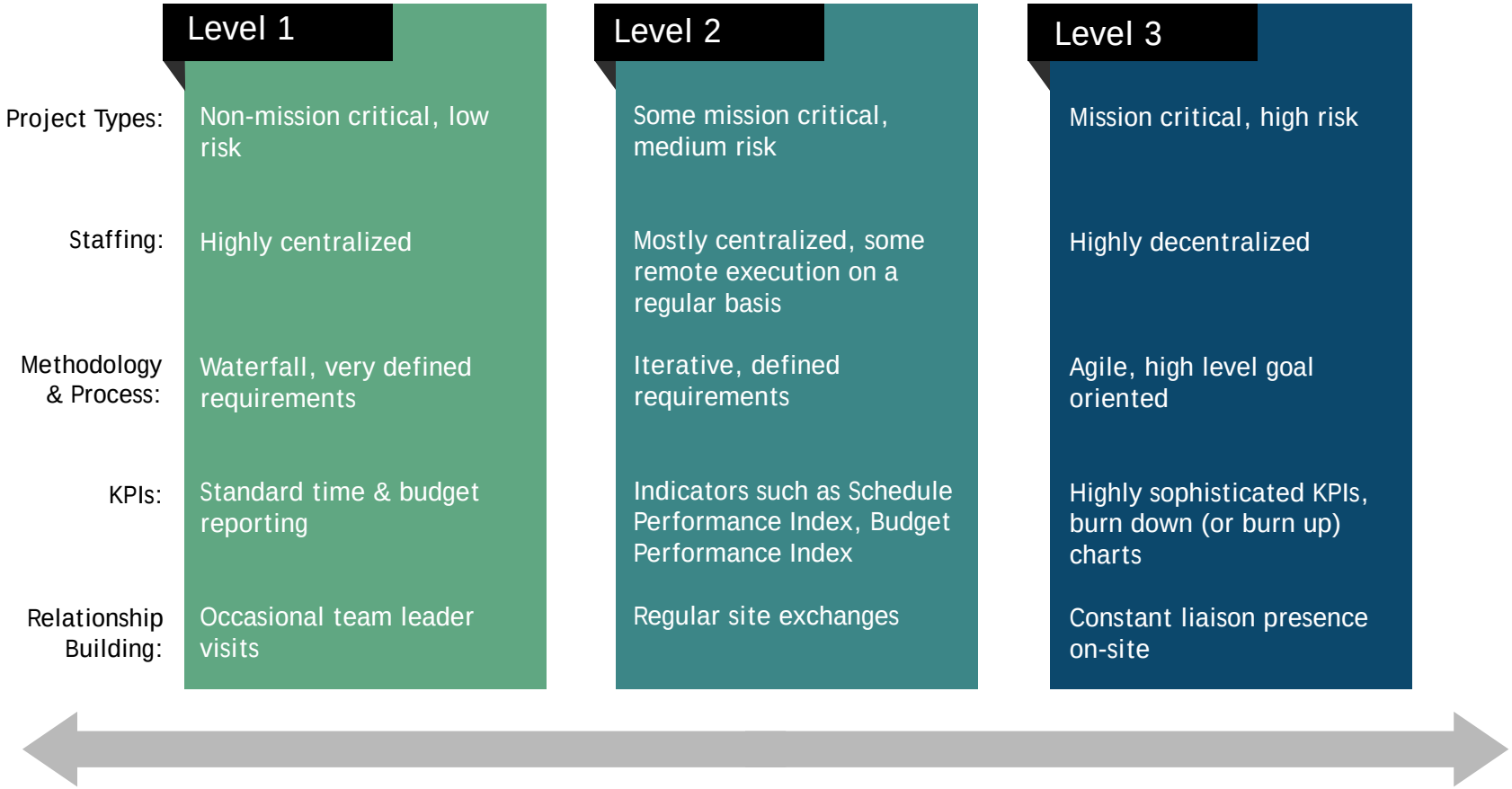
If it is not possible to bring all of the business, project, and technical leads to one location at the same time, cycling employees through each location for short visits can accomplish the same goal while spreading costs over a longer period of time.

The executives we interviewed mentioned that when working with outside providers or a geographically distant operation, having a liaison representative either from the IT headquarters at the remote site or vice-versa provided a higher level of trust and understanding between the virtual team members.

Promote an environment which respects cultural differences

Our final recommendation was mentioned by executives who were utilizing near-shore or off-shore providers either internally or externally. The success of the virtual team in cross boundary situations is impacted by the cultural sensitivity and tolerance of the ream members who are working within the virtual situation. Executives who are building these teams are well served to remember this when make virtual team assignments.

High Perfomance Virtual Teams (HPVT) Levels of Engagement



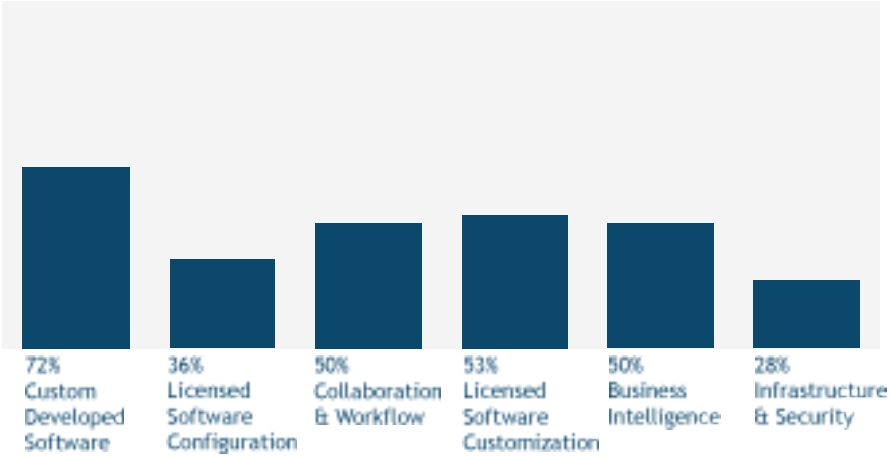
What are the proper combinations of enablers to support virtual team high performance? Can these factors vary based on the organization and size of company?

We found that the centralized versus decentralized nature of a company can have a demonstrable impact on the success of a virtual team. We also learned that companies were “tuning” their enablers based on three distinct levels of virtual team engagement.

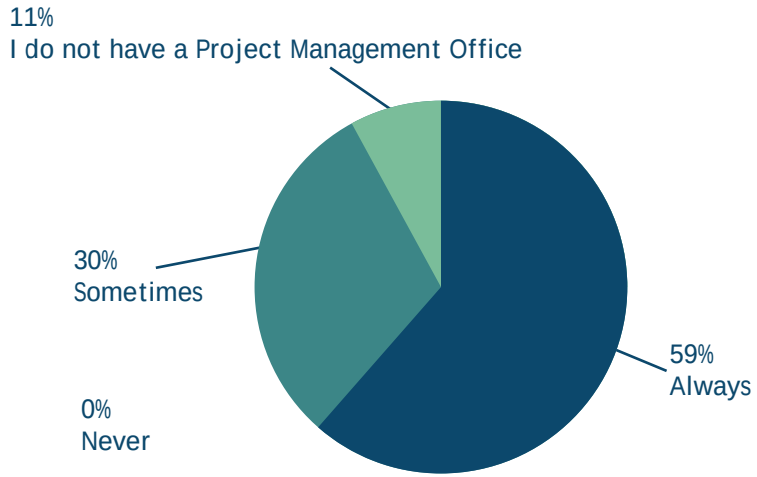
We have created the HPVT Engagement Model diagram as a reference tool for virtual teams to utilize for defining their own set of enablement factors to use with a project. The selected enablement factors are meant to be scalable and harmonized with the typical levels of virtual team engagement within a target enterprise.

Additional Charts & Data

What kinds of integration and development project types are best suited to be developed through remote execution? (select all that apply)



When remotely executing a systems integration or custom development project, does your own Project Management Office get involved?



Rank which of the following functions are most critical whenremotely executing an integration or development project.

Respondent Results:

1. Project status monitoring/visibility
2. Online Collaboration
3. Issue tracking
4. Virtual availability/presence
5. Version Control
6. Standard Documentation Templates
7. Key Performance Indicator Monitoring

Methodology of Research

AXEN & itmWEB's High Performance with Virtual Teams survey was distributed electronically from August through September of 2013 to 300 carefully selected IT leaders which resulted in a response rate of 12%. Of these, the average IT operation headcount in the participant's organizations was 170, with the largest having over 1,200 individuals as part of their IT operations.

In addition to the electronic survey, AXEN & itmWEB conducted in-depth interviews with 12 IT leaders selected for their proven experience and expertise in the subject of utilizing virtual teams for IT projects. The organizations that these individuals represent included:

- One of the world's largest automakers
- One of the world's top food and beverage providers
- One of the world largest semiconductor manufacturers
- Two of the country's fastest growing supermarket chains
- One of the world's largest computer manufacturers
- A leading utility company serving over 700,000 customers
- A leading worldwide provider of oil and gas equipment and components
- A leading building supply company
- One of Mexico's largest auto insurance providers

Authors

Russ Finney | High Tech CIO, Researcher, and Advisor | itmWEB

Russ Finney is a well-known international high tech speaker, researcher, and advisor who has worked on global IT best practices for the last twenty years.

Recently his consulting, research, and writing activities have been focused around topics like leveraging ultra-future technologies, taming virtual and cultural team issues, using agile techniques within large enterprises, enhancing teamwork dynamics and productivity, and creating innovation from within business and IT.

Prior to his current role at itmWEB, Russ served as a global IT executive with Tokyo Electron, and before that he served as an IT consultant with Ernst & Young.

Mauricio Antunez | Managing Partner & U.S. Division President | AXEN

Mauricio Antunez is managing partner and the U.S. Division President of AXEN. His expansive knowledge of world class processes and standards combined with a passion for people is a driving force behind AXEN's success.

He has over a decade of proven experience with global project execution and working with geographically distributed teams, gained from serving both fast paced emerging growth and fortune 500 companies.

Before founding AXEN, Mauricio spent time at ABASIS leading a team which architected and managed the development of business applications. Prior to ABASIS, Mauricio started his career as a software developer with Abaco Grupo Financiero.

Daniel Brown | Researcher, Marketing & Sales Manager| AXEN

Daniel is responsible for designing and executing AXEN's marketing and sales strategy in the United States. He is also AXEN's lead U.S. researcher.

Prior to his current role at AXEN, Daniel led the planning and implementation of numerous integrated marketing initiatives spanning across traditional and cutting-edge digital marketing channels. During this experience, he coordinated operations with a global team of partners and vendors with consistent success.

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