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From Outsourcing to Global Collaboration: New Ways to Build Competitiveness

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This is one of two papers reporting the results from this research. The other is "Achieving Innovation through Global Collaboration: A New Source of Competitive Advantage," HBS Working Paper 07-079.

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Executive Summary

Many companies have successfully used outsourcing to lower costs. But, unless the company's efforts are unusually good, true competitive advantage is fleeting when competitors begin outsourcing and achieving similar results.

To build sustainable competitive advantage, leading companies are now using an advanced form of outsourcing, dubbed *global collaboration,* to drive new revenue, quicken time-to-market, and increase innovation. Global collaboration impacts their top as well as bottom lines. Effectively adopting this advanced approach requires adjustments to traditional outsourcing strategy and processes.

To understand these changes better, the Product Strategy and Architecture practice within Wipro Technologies teamed with Alan MacCormack, Harvard Business School, to study 45 global collaboration projects. The competencies required for achieving top-line growth through global partners are different than the competencies required to be successful in reducing costs. Yet, many companies continue to manage global collaboration projects in the same ways they managed cost reduction projects and thus do not obtain the full potential value from these projects.

Our interviews uncovered best practices that were common to companies successful at using global collaboration. Key findings include:

- Effective global collaboration requires a strategic, company-wide vantage point. Defining the company's global collaboration goals, addressing employee concerns, adapting business processes, and creating strategic partner relationships all require senior management participation and cross-project coordination.

- Project management, development methodologies, communications processes, contractual documents, and intellectual property management practices all need to be augmented and refined, to take into account the more complex and deeply intertwined nature of the relationship that occurs within appropriately established boundaries.

- Continuous learning and refinement ensure the company builds its global collaboration competency as quickly as possible.

Adopting the most appropriate of these best practices can expedite learning and improve results for companies new to global collaboration.

Introduction

For many companies, traditional outsourcing has led to significant cost savings and has improved the bottom line. Some companies have discovered even greater returns are possible and are using their global partners to drive *top-line* revenue with innovative new products, faster time-to-market, and entrance into new markets. This shift, from traditional outsourcing to *global collaboration*, as shown in Table 1, has become a competitive advantage for these leaders and is likely over time to become a competitive necessity for all.

	Traditional Outsourcing		Global Collaboration
Project Goal	Cost reduction	→	Revenue generation
Collaboration Goal	Lower costs	→	Cost leadership Access to knowledge Access to intellectual property Faster time to market Access to new markets Build-to-revenue
Partner Value	Technical expertise	→	Technical leadership Intellectual property Business knowledge Process leadership On-demand scalability Market context and knowledge
Project Type	Maintenance Q/A New features	→	New product development New market entry New product versions

Table 1. The Shift from Outsourcing to Global Collaboration

The drivers and enablers of this shift are diverse and include:

- Increasing complexity in the breadth of technologies included within a single product
- Low cost yet highly educated labor forces in developing countries, including skill sets specialized by region
- Increasing use of global technology standards and open architectures
- Development of powerful new collaboration tools and infrastructure

Wipro Technologies, one of the world's largest global services companies, has first-hand experience with these shifts. The Product Strategy and Architecture practice, a consulting arm of Wipro located in Boston, MA, recently completed a yearlong analysis of these changes in association with Alan MacCormack of Harvard Business School. The study examined 45 global collaboration projects, interviewing over 150 product managers, directors, and subject matter experts from both hiring companies and their global collaboration partners. The goal was to identify the best practices that companies use to move from the initial cost-lowering goals of outsourcing to the revenue-generation goals of global collaboration.

We compared projects focused on global collaboration to those projects whose primary focus was cost reduction; we also compared the most successful global collaboration projects to those that were less successful.

The result of our analysis is a set of global collaboration best practices aligned to six focus areas:

- Strategy development
- Organizational design
- Product development process
- Program and project management
- Platform specification
- Intellectual property management

Use of some or all of these best practices distinguished the successful companies that realized the greatest return from their global sourcing relationships. These best practices are described in detail in the following sections. Sidebars throughout the paper document actual company experiences that best exemplify one or more best practices (a few are composites to more fully illustrate a point).

Strategy Development

In our interviews we looked at the strategies behind global collaboration projects. In more cases than not, little thought had been put into strategy; these companies typically began using global resources to lower costs and did not evolve from that goal even after executing a half dozen or more projects. The result was a de facto, unarticulated cost-reduction strategy driven at a departmental or divisional level. The strategy either was not known by employees and partners or was simply stated in terms of costs – e.g. "our strategy is to lower product

development costs by 20%." It was not unusual to have multiple strategies – one per department or division. Contracts tended to reflect this, with terms focused on time and material (perhaps with incentives).

But recognizing the potential for more successful engagements, a few companies have begun moving towards an explicit, company-wide strategy for best leveraging their collaboration with global services providers. Best practices in developing such a strategy are outlined below.

Consider more than cost-reduction

Outsourcing is rightly seen as a powerful cost-reduction tool, but confining global sourcing to this limited role leaves greater opportunities untapped. As the industry has matured, global services companies are now able to provide a much richer palette of offerings, providing value-add far beyond cost reduction. Specific areas of opportunity include acquiring capabilities and/or intellectual property (IP) not available in-house, scaling resources up and down quickly, and obtaining contextual knowledge for product, customer, or market access.

Align global collaboration strategy with business strategy

In our research, few product development organizations had a global sourcing strategy that was linked to their overall product development / R&D strategy except as a means to lower product development costs, but the business value available from global resources increases when they are used to provide functions such as handling the entire support of a product line, designing key portions of a new product architecture, and providing IP for new products.

Global collaboration strategies should be organization-wide and multi-year

The companies we talked to found that there were many issues best addressed at an organization-wide level rather than at a project level, such as:

- Defining the role of global collaboration in corporate and business unit strategy
- Changes to business processes, IP management, contracting, etc.
- Human resources issues – changes in skills sets, impact on local staff
- Development of strategic partnerships that span projects

Defining such a strategy takes time but is the best way for companies to obtain strategic rather than tactical value from global collaboration. For most companies, this strategy development is a multi-stage process. Typical first steps are an analysis and sharing of lessons learned from prior projects. Developing more sophisticated goals and metrics for future projects comes next.

Human resource aspects must also be considered – both from changes required to skill sets as well as employee concerns about the impact to their careers.

The most successful companies communicated their global collaboration strategy and rationale before projects began and again at periodic intervals, often couching the strategy in terms of an imperative to remain competitive.

Less successful companies did not address these issues before the projects began, or they handled these issues at a project level, leading to differing approaches and confusion amongst staff as to the company's overall global collaboration strategy and its impact on them.

Ensure senior management support

In the most successful companies, a senior manager took personal responsibility for the success of global collaboration across their company. In larger companies this took the form of a formal position such as Senior VP or Director of Global Collaboration; in smaller organizations, a senior manager added this role to existing responsibilities. Having this senior champion provided a focal point for creating an organization-wide global collaboration strategy rather than running activities as a series of independent projects. This manager was also able to recognize and address organization-wide people issues such as changing job responsibilities, fear of job loss, and morale issues.

Involve partners in the strategy process

Periodic (quarterly or yearly) strategy-focused meetings with partners helped in strategy development as well as ongoing monitoring and tuning. For example, the VP of Engineering for a company that designs telecommunications products stated, "we have a two year global collaboration strategy and meet with our global partners every quarter to six months so that we can understand what is new and innovative in the market and so our partner can understand

Exemplar: Including Partners in the Strategy Process

A major telecom manufacturer found itself in an increasingly competitive environment, driven by low-cost Chinese producers. The company responded by updating its product development strategy to include global collaboration as a major component

To help its partners embrace their greater strategic role, the company holds annual meetings with each of its three top-tier global partners. Dubbed "Technology Summits", the company shares its two-to-three year product strategy, as well its one-year plans. The global partner in return shares its long and short term plans.

Typical attendees include senior and line managers. The company evaluates and grades the partner on its achievements over the prior year and its anticipated strategic value in the coming years. The meetings last one or two days, and include frank discussions in both directions.

For example, strategic goals shared in a recent summit included development of a new VoIP (Internet telephony) product line, improvements to IPv6 (a key networking protocol) performance, and reducing time to market by three months. Several products were targeted for a 15% cost reduction. The company learned that, due to market demand, one partner was already building a unit dedicated to IPv6 performance. Another partner decided to train its staff on VoIP technology based on assurances that the company was willing to tap these resources when they became sufficiently skilled.

The company pushed its partners to develop senior-level technical depth in newer technologies and to show more initiative and innovation. At least one partner decided to update its training and career development approach based on this feedback. From their side, the partners made requests of the company, such as access to prototype systems and more targeted training.

our strategy and goals." This regular meeting allows the company and its partners to synchronize plans, resource needs, hires, and investments. It is best to start these conversations with partners early in the process, even before contract signing.

Align contract terms with the global collaboration strategy

Some companies described problems stemming from misalignment of goals between the product development and global collaboration teams. For example, contracts provided incentives for the global partner to focus on the lowest cost resources on a time and material basis, while the product development organization had additional goals such as faster time-to-market, solving a particular technology problem, or product development to be accomplished in a specific timeframe.

Terms of the contract between the global collaboration partner and product development organization should meet both organizations' business goals. This requires honest and early communication of business goals by both parties.

The best practices to align the contract terms with project goals are summarized in the following table:

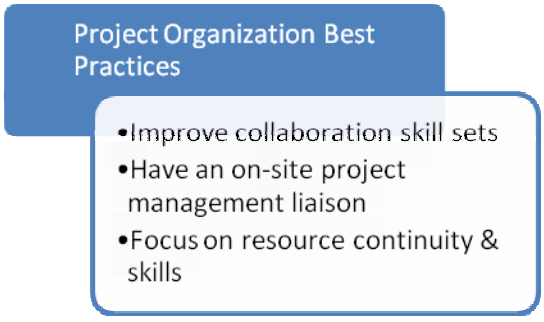
Project Goal	Contract Approach
Pure skills substitution	Straight time and material contract
Specific support services such as test, Q/A, or defect support	Incorporate service level targets, bonuses, and penalties into the contract
Specific products or product functions	Incorporate service-levels goals such as time-to-market Possible risk and reward sharing based on product sales or cost of development
Use partner knowledge to address new markets	Risk and reward sharing based on product sales or other metrics

Table 2. Aligning contract goals with project goals

Project Organization

Because many companies use a standardized, production-oriented organizational structure for their outsourcing projects, they expect to provide initial direction, hand off the project, and then get the results at agreed-upon time. But as project goals shift to a global collaboration model, this structure begins to fail. In one case, a new product development project was the first global collaboration project undertaken. Yet, it was organized in the same way as earlier outsourcing projects, with each side having its own dedicated project and reporting structure. Communications occurred only at the senior management level. As a result, programmers in one organization with questions for technical architects in the other, often had to wait a day or two to receive an answer, significantly slowing work. While this structure had worked for earlier projects, here it resulted in lack of common technical vision and ultimately project delays.

We found three best practices for organizing global collaboration projects, as described below.



Improve Collaboration Skill Sets

Special attention should be paid to skills that are required to undertake a global collaboration project. Engineers need to have skills in orchestrating and coordinating multi-site teams, not just deep technical knowledge, and this shift must be backed by the reward system. One

Director stated, “Our senior engineers now have to learn to delegate and work with partner staff across the ocean. Before, each of senior engineers was completely responsible for a design that they would build themselves.” This deep level of schedule coordination is critical for success. Leading companies provide training in topics such as delegation, team-based design, project management, and working across cultures. These efforts greatly improve global collaboration.

Have an on-site project management liaison

Successful project management is a key predictor of overall project success. Both the company and its global partner should supply a project manager, one of whom should work on onsite at the other’s location (it can be in either direction).

Several of the companies we interviewed initially tried to lower costs by not including an on-site component to the project, but virtually all of them changed their approach over time. “We thought we could save money but found that communication suffered too much. Having an on-site liaison is definitely the way to go”, stated one project manager. Tactical cost saving efforts can greatly inhibit the strategic success of global collaboration.

Exemplar: Project Organization Practices

A software developer had five global collaboration projects underway, working with two different partner organizations. Senior management came to realize that each project was experiencing similar problems in project management, partner management, partner engineer turnover, and communications across continents. Each project was attempting to solve the issues on their own, not realizing others had similar problems. With this insight, the company made strategic changes spanning all five projects.

First, they created a Global Product Development Director, a senior manager responsible for oversight on all global projects. The Director instituted a series of quarterly meetings where project sponsors and program managers from all five projects presented project status, learnings, and issues. By sharing best practices and jointly tackling hard problems, the company began institutionalizing its global collaboration skills.

It developed an entire curriculum to train its project managers and lead architects on the management of distributed teams, on effectively working in multi-cultural teams, and techniques for distributed product development. The company arranged for a product development methodology course to be taught to both internal engineers as well as engineers from the partner companies – with each firm picking up the tab for their respective training costs.

To improve project communications, each partner placed a project liaison onsite at the company. Each of the company's project managers visited its partner organization once or twice a quarter.

The company placed a high value on staff continuity at partner organizations, because it wanted the engineers who had become skilled in the company's products and processes to staff follow-on projects. The Global Director put a series of initiatives into place to make partner team members feel valued and part of the company team. It sponsored trips to the US site for partner engineers, awarded certificates of achievement, and increased management visibility for senior partner technical staff—such as lunches, one-on-one meetings, and just dropping by. These combined efforts resulted in an 80% decrease in partner staff turnover – down to 4%, as compared to 20%+ on earlier projects.

Focus on resource continuity & skills

During traditional outsourcing projects, little attention was placed on skill levels and continuity of partner resources. Typically, changes in personnel were accepted and completed through a contractual agreement providing two to four weeks notice. Skills transfer was accomplished during this transition time.

As a company looks to its partners for contextual market or industry knowledge, continuity of resources and skill levels on the partner side become much more important. But, global partner resources sometimes have incentive to move from one project to another, for example, to gain new skills, to be promoted to a more senior position, or to gain exposure to a different industry. What is good for the global partner staff is not always good for the project on which they are working.

To address this situation, product development organizations worked with their global collaboration partners to ensure the continuity of key project resources. Companies highly skilled in global collaboration tended to take a two-pronged approach:

1. At the project start, they provided cross training so that every person had a backup.

2. The product development organization provided incentives for global partner resources to stay on projects, such as:

    - Training in new products and/or technologies
    - Small monetary rewards
    - Non-monetary recognition
    - Joint patent opportunities
    - Two-to-four week travel opportunities to participate as part of the US project team

The goal of resource continuity also crossed projects. Product development organizations that most effectively addressed this issue ensured that key resources would be available for a sequential series of projects by ensuring that a new project was starting as an existing one ended or by obtaining assurance from the global partner management that specific resources would be retained. Some project contracts included named staff to minimize change in personnel.

Product Development Process

Over ninety percent of the projects reviewed used either a modified stage-gate or modified waterfall product development methodology. These are excellent methodologies, but they may need to be extended to encompass external collaboration partners. We found four best practices in this area.

Extend development methodologies to include multi-site and collaboration processes

Most methodologies assume single-site development. Global, collaborative, multi-site development requires augmented processes, communications, and technologies.

Considerable thought should be put into building collaboration and communications processes that span continents, time zones, and cultures. Business processes, development methodology, and company culture all need to be considered.

Globalized product development requires additional activities related to sharing artifacts, synchronization, handoffs, etc. Integration processes must be carefully designed and tested. Global partners often have significant expertise in these areas and should be asked to contribute their insights.

That does not mean the two organizations have to perform each activity identically. Decide how much variation is allowed in the same activities performed in different sites.

Successful methodology extensions and improvements should be codified and shared across the company, especially with other global collaboration projects.

Decide whether to use one methodology or two

When using global collaboration for product development, companies must decide whether to use a single product development methodology or allow their global partner to use

their own in-house methodology with which they have most experience. For simple projects, companies often found it easiest to have their global collaboration partners adopt their in-house methodology. Larger and more complex projects require more thought, and in these cases companies took different approaches.

In our interviews, several product development organizations stated that their goal was to have their global collaboration partner use the product development organization's product development methodology. "[The global collaboration partner] may have some new ideas but it is easiest for us to use our own process," said one high tech product manager, asserting a common sentiment.

In other cases, each location used its own methodology. For example, on a series of software development projects, one location used a waterfall methodology while the other one used an agile development methodology. In these cases, weekly and monthly builds were used to synchronize the results. Because each team used the methodology in which they were trained and practiced, the process worked smoothly. Well-designed integration processes were a critical success factor in making this approach work.

Employ a continuous-improvement process

Global collaboration projects are a new experience for most companies. Those who take the time to analyze and learn from each project tend to have superior results.

All companies interviewed said that the effectiveness in using global collaboration partners improved over time. However, those most successful in the shift from tactical to strategic partnerships placed emphasis on continuous learning and on sharing this learning across projects and codifying them in company processes.

It is especially important for companies to be willing to learn from their global partners. Partners at times had important insights for methodology improvements but found their client had no interest in adopting their suggestions. An external perspective from a partner, especially on methodology extensions for global collaboration, is of potentially great value.

Formal end-of-project reviews are an important tool for crystallizing lessons learned and disseminating the information to other projects. Partners should use these reviews to discuss and address difficulties and mistakes in the global collaboration effort. Root cause analysis can be a very helpful means to uncover and learn from past experience. While end-of-project reviews are part of most product development methodologies, we found that, in practice, such reviews are not often held. The most successful companies regularly held end-of-project reviews and ensured their partners were included in the process.

Exemplar: Extending Development Methodologies

A telecom company acquired an Offshore Development Center (ODC) as part of a firm it had purchased. The ODC engineers were employees of the company but were located in India. The company asked the ODC to use its existing stage-gate methodology to assist in developing its next generation product. As deliverables became due, it soon became apparent there were significant differences in how the two locations defined deliverables. For example, the company expected the detailed design to be at a level from which code could be written; the ODCs understanding was that it should deliver a higher-level specification. In another case, the company was expecting a circuit board prototype in working order and ready for integration; the ODC delivered a board that was at beta test level. "We expected the deliverable to be at our standards. The ODC delivered it to their standards. Neither was wrong; they were just way different."

They also found that small issues, which previously had been easily addressed via informal person-to-person discussions at a single site, could grow into significant issues when multiple locations and organizations were involved.

Based on experience with this initial project, the company made significant updates to its development methodology.

- They increased the number of design reviews, particularly at the beginning of each phase when it was especially important to ensure everyone was "on the same page".
- They added more structure to the review meetings, such as defining explicit inputs and results, making meeting roles/responsibilities clear, and adhering to agenda timing. This additional level of detail ensured all parties came to the meeting appropriately prepared and that all agenda items would be completed. This also enabled them to make best use of the limited amount of workday overlap between the two time zones.
- Deliverables were more clearly defined.
- They formalized when the partner can use its own methodology approach (e.g. testing) and when it should use the company methodology (e.g. design).

Consider the partner team as part of the company organization

As product development organizations start to use global partners for new product development rather than just support activities, these global resources need to be better integrated into the overall project team. Successful companies viewed their global partners as a remote location of the product development organization, going so far as to call their global partner by their own name, such as "TechCo Development Center-East". The global partners participated in organizational and team meetings and received relevant general e-mails and notices, etc. Of course, not all of a company's information should be transmitted to their partner, but the global location should be considered part of the product development organization as much as possible. Companies who took this approach realized:

- Improved morale in the global collaboration team

- Greater camaraderie between the product development organization and global resources
- Better communication among team members

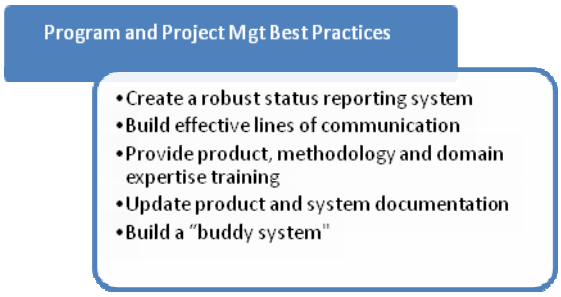
Overall, there was a heavy emphasis on ensuring communications were frequent and took into account cultural and time zone differences.

Program and Project Management

The closer linkage required for global collaboration projects requires new or augmented program and project management techniques. We found five best practices in this area, as described below.

5P ANALYSIS - TEAM 1		
TOPIC	**KEY QUESTION**	**SCORE**
PEOPLE	Is our team all right and working well?	**4**
PROCESS	Are our processes to get work done functioning well?	**3**
PERFORMANCE	Are we delivering high quality work as per expectations?	**4**
PROJECT MANAGEMENT	Is the project managed to ensure quality and satisfaction?	**3**
PERCEPTION	What is the perception of this project?	**4**
AVERAGE 5Ps SCORE		**3.6**

Table 3. Sample 5Ps Analysis Report



Create a robust status reporting system

Status reports are a mandatory deliverable for all global collaboration projects. Too often though, typical project status reports list only factual information such as current status, issues, and future plans.

We learned that the best status reports contain both factual and attitudinal information, presented in a quantitative manner. A favored approach, dubbed the"5Ps Report", as shown in Table 3, includes both types of information and has received high praise from many product development managers.

Scores across the 5Ps are tracked weekly or monthly to identify what is going well, issues as they arise, and trends over time.

We found that there was often a disconnect on project status between the project team and senior management. The 5Ps reports can help close this gap by including input from and circulation to staff, project management, and senior management on both sides.

Build effective lines of communication

Communications are the lifeblood of any successful project. With global collaboration, project teams need to be much more integrated and communicate much more frequently than in traditional outsourcing. We found several practices that enhanced communications with global collaboration partners.

Direct contact between project team members in different locations works better than having a single point of contact on each side. The latter

Exemplar: Creating a Robust Report System

Senior managers of a software development firm were frustrated. Their status reports showed the new global collaboration project on schedule according to metrics used on previous cost-focused outsourcing projects, such as number of tests performed or bugs found. Despite this, both the partner and their own staff where concerned these metrics were not reflecting actual progress and problems.

After investigating they concluded that the tangible metrics used so successfully on previous outsourcing projects were not sufficient. Global collaboration projects, with emphasis on creativity, innovation, and design, necessitated capturing softer measures, such as morale and the engineers' perception of project progress. These can be informally assessed when the team is down the hall but not when it is across the ocean.

Working with its partner, this company began using a "5P's Management Report" measuring People, Process, Performance, Project Management, and Perception, as shown in Table 3. On a weekly basis, both companies' managers and technical leads rated the project according to the 5P's. In conjunction with trending analysis and traditional metrics such as activities completed vs. planned, this report provided both hard and soft metrics on how the project was proceeding.

For example, in one case when the Perception measure dipped, investigation identified that jointly designed software had/suffered performance issues. Project managers from both sides were hesitant to raise it as an issue because it might reflect badly on them. Additional resources were applied, and the issue was resolved. With the new 5 P's approach capturing a more complete picture of project status, the overall satisfaction of the team leaders increased 20%, as measured by the report.

approach is time-consuming and results in miscommunication during information handoffs. Projects that chose a single-point-of-contact approach found that developers created an underground communication network providing direct team member-to-team member communication.

Communication norms should be explicitly established at the start of the project and should take into consideration the culture of both organizations. For example, in some companies interaction is encouraged on an ad hoc basis as questions arise, while other companies prefer "visiting hours" – hours during which interruptions are acceptable as compared to other times that are dedicated to uninterrupted, heads-down work.

The appropriate communications infrastructure and processes should support these norms. E-mail is the most common communication technology used in cultures that have "visiting hours"; instant messaging is the most common multi-site communication technology in organizations with a "drop in" culture. Interestingly, phone calls, though used when needed, are usually not the preferred ad hoc communication mechanism, due to time zone differences and sometimes language difficulties.

Provide product, methodology, and domain expertise training

Many companies did not provide up-front training for their global partner on technologies, methodology, or industry context, causing the partner to learn "on-the-fly," which is inefficient.

The most successful companies invested up front in training their global partners on development methodologies and domain expertise, rather than assuming the partners would pick it up by assimilation or asking questions. These interactive sessions also allowed the client companies to learn from their partner, for example in the area of global collaboration techniques. It also provided a jumpstart to building relationships between the teams.

Update product and system documentation

One key process for quickly transferring skills from a company to a global partner, particularly at project start, is for the partner to review current product documentation / specifications and product development methodology documentation.

This approach relies on accurate and up-to-date documentation. One product development manager mentioned, "using a global partner showed us deficiencies in our documentation, which was out of date. In retrospective, the project would have started better and more quickly if we had updated project specs." Lack of updated documentation also resulted in additional in-person product and methodology training.

Build a "buddy system"

The culture of many offshore personnel is to try to investigate and answer questions themselves rather than ask for assistance.

Several companies we talked to had created a buddy system at the start of a project, linking offsite staff to onsite staff with similar responsibilities, to make it easier to resolve questions quickly. This was particularly effective when buddies were able to meet face-to-face for training or at a project kickoff.

Platform Specification

The technical infrastructure and processes supporting a global collaboration project have a major impact on project success. We found four areas where companies must pay particular attention.

Have the company and partners use the same versions of the same tools

During our interviews, we found a wide range of practices in coordinating the use of development tools. At one extreme, a company and global partner used entirely different tools during development. Others used the same tools but different versions. The most successful projects ensured that both companies used the same versions of the same tools at all times.

A clear technology best practice is to use the same version of the same product design software, including the artifact repository. Some design software supports global capabilities, providing easy integration between the two sites. In other cases, the integration must be "added-on" via synchronization processes. Homegrown artifact repositories should be used only in extreme cases where no packaged software comes close to meeting requirements.

Determine data synchronization needs

The more closely teams work together on a project, the more synchronized they must be in sharing their design artifacts. In the projects we reviewed, two primary technology architectures were used:

The Dangers of Dissimilar Development Platforms

Through hard-won experience, many companies and partners have learned the value of having identical development platforms. The Airbus A380 superjumbo plane is poster child of the rippling effects that can result from even small differences in the product development platform. Due to cultural, cost, and timing reasons, German engineers who designed the A380 wiring used Catia V4 design software. French engineers used Catia V5 to design the fuselage. Design specifications were exchanged between the two engineering groups, but no prototype was produced—a risky decision, but one that saved considerable schedule time. When the first fuselage was built, they learned the 300 miles of wiring did not fit – an enormous problem. It is believed that the incompatible designs resulted from major data errors, such as changes in measurement and loss of engineering notes, when integrating the files from the different software versions. Production problems have delayed the debut of the A380 plane by two years and caused an estimated US$6B in losses.

1. One global instance of the product design software. The software spans both sites, synchronizing the various development locations and product design versions at intervals as quickly as near real-time.
2. One instance of the product design software at each development location. Integration of designs between locations is performed by design teams sending or copying data at predefined intervals (typically once every twenty-four hours).

Assume throughput requirements will grow over time

Several project teams we interviewed were in the process of upgrading either the development software or the network bandwidth after finding the demands on their infrastructure had grown significantly since the project started. Upfront analysis should examine likely growth in throughput and establish a plan to upgrade the infrastructure over time.

Test the use of video conferencing

Several projects either tested or used video conferencing, with mixed results. Some project teams thought it was very valuable, while others ended up using it sparingly or not at all. Our recommendation is to test video conferencing to see if it fits within your organizational culture and to determine its effectiveness in your particular situation.

Intellectual Property

Questions of sharing intellectual property (IP) came up during the interviews. Companies were concerned about protecting their own IP. We also found they were often not effective in taking advantage of the IP of their global collaboration partners.

Use partner intellectual property when available

Increasingly, global services providers create their own intellectual property, generally either software assets and processes that improve the product development process or patents for specific core product technologies.

Wipro, for example, has significant intellectual property and holds patents in areas such as wireless LAN, Bluetooth, and digital imaging. Some clients use this intellectual property to significantly reduce their product development time-to-market and costs compared to building the capability from scratch.

During our interviews, we learned that the "NIH" (not-invented-here) syndrome frequently forestalled investigations into using partner IP.

Partner-supplied IP should be considered on a case-by-case basis, measuring the cost and time-to-market advantages against disadvantages such as differences in control of the intellectual property and ability to create derivative works. Ideally, clear processes and guidelines for partner IP use should be available as part of a company's Global Collaboration Strategy.

Manage access to your own intellectual property

The management of a company's intellectual property during a global collaboration project can be complex. The partner needs easy access to appropriate IP but should not have access beyond that.

All of the companies that we interviewed included legal protection of IP in their contracts. Although we did not review contract language, when we asked whether the management of IP was important, we found three different approaches:

1. Management of and access to IP in a global collaboration environment should be more restrictive than for on-site subcontractors and partners.

2. IP in a global collaboration environment should be managed the same as with any subcontractor / partner.

3. Knowledge is quickly advancing in the industry; IP needs to be managed so that it doesn't slow down development and innovation

The majority of projects opted to follow the second alternative – manage IP with global collaboration partners the same as if it was with on-site partners.

On a more tactical level, we found technology issues related to the actual process of sharing. Usually, design artifacts are stored in some sort of artifact repository. These repositories are often home to many products and projects and are not partitioned to limit partner team access to only the relevant design components and artifacts needed for their project. To address this, some projects created a separate design library for their project alone, though this could create versioning differences with the "master" library.

Even worse were cases where access for sharing designs was grantable only at a sever level, which opened everything else on the server to the partner. This problem can happen in either direction; the global partner needs to protect their IP rights as well.

Exemplar: Manage Access to your Intellectual Property

More than 200 people from a software developer and its three global partners were involved in developing firmware for a new system-on-a-chip design. Initially, all project team members had access to the developer's entire code repository, including much code unrelated to the work they were responsible for. All code was stored on a single server using library and file naming conventions to differentiate various products and builds. Team members were given access to the entire server because the firmware for a specific product generally accessed code from a number of libraries.

Realizing the potential intellectual property (IP) risk of exposing thousand man-years of code and design, the company rethought its entire approach to IP access. The key was creating role-based access control so the global collaboration partners as well as their own staff had access to only the IP they required. This required creating a taxonomy that specified the appropriate level of access and controls that should be placed on different classes of IP and then the implementation of tiered access and controls by partner, role, and class of IP.

Business decisions were then made as to which intellectual property and proprietary information was needed by a global partner in order to fully participate in product development, while not exposing more IP than was necessary. This method is shown in Figure 1.

Artifact Type	Product / Version				
	Product A V1	Product A V2	Product B V1	Product B V2	….
Market Forecast	Designer	Designer			
Requirements			Designer	Designer	
Project Design	Designer	Designer	Designer	Designer	
Component Specs		HW Tester			
Prototype	HW Tester	HW Tester			
….					

Figure 1. Artifact Table

Using this technique, every product engineer was assigned one or more products in one or more roles, each role having access to specific artifact types. For example, one person may be a designer (their role) and therefore would have access to market forecasts, product designs, and prototypes (artifact types) for the products they design. A hardware tester, on the other hand, may have access restricted only to a prototype component and the component specifications. A software tester would have access only to overall design specifications, detailed specifications of the component to be tested, the component source code, and binary code.

Conclusions

The evolution of outsourcing into value-creating global collaboration provides a significant competitive advantage for those who employ it effectively. Interviews with staff on over 45 global collaboration projects illuminated common stumbling blocks as well as best practices used by the most successful projects. Recognizing that global collaboration projects must be managed differently than traditional outsourcing, these projects invested in new approaches across strategy, organizational design, development processes, project management, platforms, and IP management. The most successful extended the lessons learned from the project level into development of a corporate-wide strategy for global collaboration, which was enhanced over time by a continuous learning process. The results were faster time-to-market, quicker uptake of emerging technology, successful entry into new markets, top-line revenue growth and continued lowering of cost.

Appendices

Best Practices Summary

This section consists of best practices in tabular format for easy reference.

Category	Best Practice
Strategy Development	• Consider more than cost-reduction • Global collaboration strategies should be aligned with business strategy • Global collaboration strategies should be organization-wide and multi-year • Ensure senior management support • Involve partners in the strategy process • Align contract terms with the global collaboration strategy
Project Organization	• Improve collaboration skill sets • Have an on-site project management liaison • Focus on resource continuity & skills
Product Development Process	• Extend development methodologies with multi-site and collaboration processes • Decide whether to use one methodology or two • Employ a continuous-improvement process • Consider the partner team as part of the company organization.
Program and Project Management	• Create a robust status reporting system • Build effective lines of communication • Provide product, methodology and domain expertise training • Update product and system documentation • Build a “buddy system”
Platform Best Practices	• Have the company and partners use the same versions of the same tools • Determine data synchronization needs • Assume throughput requirements will grow over time • Test the use of video conferencing
Intellectual Property	• Use partner intellectual property when available • Manage access to your own intellectual property