

Developing BI Projects Across Time Zones and Borders

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INFOCEPTS

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Introduction

Lower costs, accelerated development cycles and access to high quality, skilled resources are just some of the reasons that organizations are using geographically distributed teams to develop their business intelligence (BI) applications. In this development model project tasks are assigned to the resources best able to complete the task, at the lowest cost, regardless of location. Significant portions of the work are performed in low cost offshore development centers, resulting in dramatic increases in BI project ROI.

This opportunity to maximize ROI also presents a set of risks and challenges that are unique. Communicating requirements across time zones, coordinating tasks conducted in multiple geographies, and recruiting, hiring and training skilled BI consultants remotely are all challenges that need to be met and overcome.

However though the practice of using distributed teams to develop and support BI projects is accelerating, few service vendors understand both distributed development and the specific nuances of BI development. BI development is different than traditional software development, as it requires closer communication with business users, and more frequent iteration. It is important that a services vendor deliver processes and skills that are specially designed for distributed BI development. Only then can the benefits for be realized.

Making the case for distributed development

What will my organization gain from using a geographically distributed team for our business intelligence projects?

At its heart is a very simple proposition that allows you to distribute your BI development between onsite and offshore locations so that you can take advantage of large differences in labor costs. Lower costs however do not mean that you have to settle for lesser skills. Frequently, offshore skills and processes are at a higher level than their onshore counterparts. Benefits also include:

Flexibility – The resource requirements for a typical BI project begins with a small number during the requirements and design phase, expands during development, and then declines as the project moves to production. During each phase specialists are required in data integration, database and analytical tools. Offshore resources provide you with the flexibility to adjust resources during each phase, and access to specialized skills at a lower cost. Short term projects and proof of concepts (POCs) benefit from this flexibility as well.

Quality of Services – With highly educated professionals and world-class processes offshore development shops often exceed the capabilities of onsite shops. The client gets access not only to the highly skilled resources on the project but also to the offshore vendor's shared knowledge pool and experts. A measure of the level of process maturity of offshore locations is the Capability Maturity Model (CMM) achievement level in India. 37 of the world's 50 "Level 5" CMM companies are based in India.

Accelerated development cycle - Differences in time zones and locations do add organizational and communications complexity, however if properly managed, projects gain from an extended, nearly 24-hour work day. In a typical 24-hour cycle scenario, an onsite BI project manager will spend the first few hours of his morning reviewing BI reports developed by an India-based team. The offshore team would be available for a few hours to receive the project manager's input. Once the Indian team has finished its work day, the project manager could draft additional reporting requirements which would then be worked on overnight in India, for review the next day.

What are the cost savings I can expect to achieve?

The primary benefit of a well managed onsite/offshore DW/BI project is an overall savings in cost, ranging from 35% to 45%. For illustration, let's consider a typical departmental BI project, requiring one Project Manager/Business Analyst, one experienced Technical Architect and three experienced BI developers. We further assume that:

1. All positions are contracted. Comparisons between hired employees onsite and a dedicated "captive" center offshore would produce similar results.
2. The project's duration is six months.
3. The onshore Project Manager's rate is \$170 per hour. The project manager works 40 hours per week when all the work is done onshore and 25 hours per week when the distributed model is used.
4. The Technical Architect's rate is \$150 per hour.
5. An onsite BI Developer's rate is \$100 per hour. Three developers are required.
6. An offshore BI Developer's rate is \$30 per hour.
7. The offshore Project Manager's rate is \$40 per hour.
8. All hourly rates include all travel and related expenses.

The table below provides an analysis of the potential savings:

Role	Onsite cost	Distributed		Savings \$	%
		Onsite cost	Offshore cost (India)		
Project Manager/ BA	\$ 176,800	\$ 110,500			
Technical Architect	\$ 156,000	\$ 156,000			
BI Developers (3)	\$ 312,000	\$ 0	\$ 93,600		
Project Manager offshore			\$ 31,200		
Total Costs	\$ 644,800		\$ 391,300	\$ 253,500	39.3%

What are some of the challenges and risks with offshore BI development that I should be aware of?

Offshore BI development does present a set of risks and challenges that need to be effectively managed. First and foremost, the organization needs to determine whether or not it is ready for distributed development and what it hopes to accomplish from the initiative. Is the DW project under consideration even appropriate for an onsite/offshore model? Does the initiative have a strong sponsor, and is he/she committed to making the initiative a success? Though all projects have associated risks and challenges, there are ones that are more prominent in onsite/offshore development. These are presented below under three categories: Provider related risks, Process related risks and Communications related risks.

Provider related risks – As with any initiative to select a vendor to provide a set of services, selection of an onsite/offshore vendor must be in alignment with the business’ objectives and requirements. Paramount for offshore development:

Trust & Chemistry – In a distributed model, where many in the team will be working remotely, you must be able to trust that your provider is operating in your best interests. It is also important for you to judge whether the offshore team has the right “chemistry” to work with other team members. An initial kickoff visit by either the client or the offshore vendor team member goes a long way in establishing trust & chemistry

Setting of expectations – Many projects fail when one party doesn’t communicate, and the other doesn’t understand what is expected of them. With distributed development, it is absolutely critical for both parties to understand what the other party expects upfront, before beginning any engagement. There must be specificity about the performance, cost and capacity of the provider to provide the services desired. Three basic questions need to be answered:

- What role will the vendor play?
- What role will your organization play?
- How will they work together?

Required skills, availability, roles and responsibilities – Though offshore locations like India generally offer highly qualified resources, these resources may not be the most appropriate for your project. Specialized skills are especially difficult to find. A related concern is the high turnover of qualified resources in some of the major offshore locales.

Infrastructure & Security – Most reputable offshore providers are located in software technology parks that provide high speed internet access, 24x7 power back-up, security and redundant systems. Included in your due diligence should be a review of the provider's security policies and practices to ensure that your data, information and business practices will be kept confidential.

Process related risks – Given the time zone and geographic differences, the processes you follow are especially important for offshore BI development.

BI/DW development processes – Business intelligence application development is a highly iterative process requiring frequent, close interaction between business users and the technical team. Differences in time zones and locations can make this iteration difficult. Accurate, complete documentation and frequent communication is crucial. Frequent, defined checkpoints need to be set to ensure that the project's objectives are being achieved.

Mismatch of processes – This can occur either because the organization is accustomed to more traditional SDLC development (as opposed to iterative BI development) or uses accelerated methodologies such as agile programming. In either case, it is important that the processes that the offshore team follows complements and mirrors the processes followed by the onshore team. Also be aware of differences in process maturity (e.g. CMM 5 vs. no CMM).

Poor governance and quality assurance – Too often “out of sight” becomes “out of mind”. Project sponsors and managers assign tasks to offshore resources and expect that the offshore resources will be able to operate as if they are co-located. Offshore development does add additional governance overhead. This needs to be accounted for.

Knowledge transfer management – Given the remote location of the development resources, knowledge transfer has a high likelihood of being encumbered. Specific procedures must be in place to ensure that the information is adequately documented and communicated.

Communications related risks – Numerous studies have revealed that the number one cause of project failures in general is due to communication mishaps. Offshore development is no different.

No communications planning – A plan that includes holiday schedules, frequent meetings, communications methods (voice calls, IM, etc) and reporting needs to be in place. For BI projects, there must be a minimum overlap of two hours between the schedules of onsite and offshore teams to ensure that there is adequate time for live discussion.

Language, culture and business practices differences – Though English is a primary language and widely spoken in offshore hotspots like India, differences do remain in style and in decision making context. In some cultures, including India, questioning authority is considered disrespectful. This “respect for authority” can lead to offshore teams working directly from provided specifications even if a more optimum method is known. Plan for an initial warm up period at the beginning of any project to allow all team members to become comfortable with each others styles and practices. Try not to begin projects with complex tasks.

Financial considerations – Overall project costs need to include additional budget for communications, network security and other related infrastructure costs including costs for project management tools. Other costs often missed include the additional project overhead to manage offshore resources.

What factors are critical when considering use of distributed teams for business intelligence projects?

Research and experience in using distributed teams for BI development has revealed at least seven factors that are critical to success. The following (some of which have been expanded upon in other sections) would make anyone's top list of critical success factors:

1. **Risk Mitigation** – Some practitioners argue that managing distributed development is all about mitigating risk. Any plan should focus on de-escalating major risks to moderate or minor risks. The risk mitigation plan should be documented and should either reduce the impact of potential risks, or the likelihood of occurrence.
 2. **Project Planning and Management** – Classic project planning and management practices, whether based on the Project Management Institute (PMI) or other frameworks is crucial. Project management needs to consider that distributed development sets off potentially disruptive forces that need to be balanced with constructive ones. For example, geographic dispersion and potential communication breakdowns can be balanced with collaborative technologies (online interactive whiteboards, instant messengers, video-conferences, etc).
- BI development specifically requires that sufficient time and resources be devoted to helping the offshore team understand the business, its requirements, and how the logical and physical data models support the project. The goal should be to make the offshore team self-sufficient. The offshore team should also be given complete access to the development environment, or consideration should be given to setting up a parallel development environment offshore.
3. **Communication** – The pitfalls of shoddy communication are noted earlier in this FAQ. For BI, where iteration between the business and IT is critical, one can rarely over communicate.
 4. **Provider** – The service provider's depth of experience, both in the chosen technologies as well as in distributed delivery will factor greatly in the project's success. Numerous onsite/offshore services organizations are qualified to do traditional software development, however very few have the necessary specialized experience in both BI and distributed development.

5. **Cultural Mismatch** – Noted earlier in this FAQ. Especially for organizations new to offshore development, plan time to get everyone accustomed to working with individuals from other cultures.

6. **Organization Readiness** - Not every organization and every BI project is suited for distributed development. Take the time to assess your organization's readiness. Some specific questions you may want to ask:

- What is the organization trying to accomplish with offshore BI development?
- Are the projects understood well enough for offshore delivery?
- Do key individuals in the organization understand the risks and benefits of offshore BI development?
- Do project managers have the necessary skills, attitudes and experience to successfully implement the program?
- Are the skills for requirements gathering, analysis and design readily available to support the initiative?
- Is the computing and communications infrastructure suited to offshore BI development?

7. **Change Management** – Even for the most mature organization, distributed development presents changes to “our usual way” that need to be addressed. Follow change management best practices to manage resistance and the natural human tendency to avoid change.

What types of business intelligence projects are more suited to distributed development?

As described elsewhere in this FAQ, distributed development for BI projects presents a set of challenges an organization must be ready and able to manage, to benefit from the opportunity. If well managed, most business intelligence projects can be developed via a distributed model. Suitability of specific projects largely lies in the specific characteristics of the company choosing to deploy the model.

Generally however, corporate requirements for confidentiality of data can dictate which projects are suitable. There is obviously more sensitivity to customer and employee data than to product data and/or sales data. Even this requirement however can be managed through

masking of data, or the use of sample data. This does add additional overhead, however for larger projects the overhead may be worth it.

The complexity of the BI project must also be considered. More complex projects will likely be less suited when new to distributed development. Consider the following decision criteria: How many data sources are involved? How complex are the business rules and the necessary transformations? How complex is the business – and the data model that represents it? How much iteration will be required between the business users and the developers? Will the reports be complex and difficult to document and explain? And, what level of customization is planned for the user interface?

Organizational and management issues

How do I judge the infrastructure of my potential provider's offshore facilities (i.e. physical, computing, people, etc)? How do I evaluate the skills, experience and quality of my potential provider's offshore team?

Largely, one has to either work with a trusted provider, or conduct extensive due diligence. For many projects, a trip to the service provider's offshore location is absolutely necessary. During the trip ask about the quality of infrastructure, disaster recovery procedures and talk to the personnel responsible. Take the time to meet and interview those that will be potentially working on your projects. What level of BI skills and experience do they have? How long have they been with the company? Attrition is a big problem in offshore locations such as India. Note what measures the provider is taking to stop attrition.

How do I evaluate my potential provider's security policies? How can I make sure that the confidentiality my data will not be compromised?

A security review consisting of a thorough examination of the provider's security policies might be necessary. It should also analyze the procedures in place to implement the policies and it should assess how well the policy and procedures are actually implemented. For many projects, a trip to the service provider's offshore location is advisable. During the trip, ask the hard questions, such as how data confidentiality is protected, and then ask to see how

the practice is implemented. What does the vendor have in place for securing the network from external threats? You may consider creating a special offshore/development segment of your network allowing your offshore engineers to work, while not providing access to the rest of your internal systems.

Taking precautionary steps such as information, , using customer identification numbers instead of Social Security numbers and the like will not only reduce your risk exposure, but may also protect your company from regulatory oversight as well.

Finally consider that despite some high profile cases, data is no more likely to be compromised in an offshore location than in an onshore (within the company) location. Regardless, you need to ask the provider what processes have been instituted to secure data. Compliance to standards such as the ISO/IEC 27002 is a good way to judge this as well.

How do I manage projects where team members may be located in multiple locations, across multiple time zones?

First of all, do plan for some added overhead in managing the multiple interfaces between locations and distributed project personnel. Technology has greatly enabled remote management with collaborative tools (e.g. IM, VOIP etc), as previously outlined in this FAQ. Some basic DOs and DON'Ts to think about:

DO:

- Discuss and agree upon communication methods to the last detail.
- Create templates for communicating (Report Design, ETL Design, etc).
- Plan for formal written handoffs and overlap as work days begin and end in different time zones.
- Have continuity in key positions.
- Conduct formal training during the project kickoff and refresh as needed.
- Understand cultural, communication and work-ethic nuances of the offshore team.
- Accommodate different communication styles by communicating the same information in multiple modes (i.e. structured documents and emails, voice chat, IM, video, etc).
- Encourage “personal” communications between onshore and offshore teams to the extent possible.

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- Provide 24 by 7 technical support for the VPN and development servers.

DON'T:

- Think “Out of sight, Out of mind”
- Micromanage the offshore team

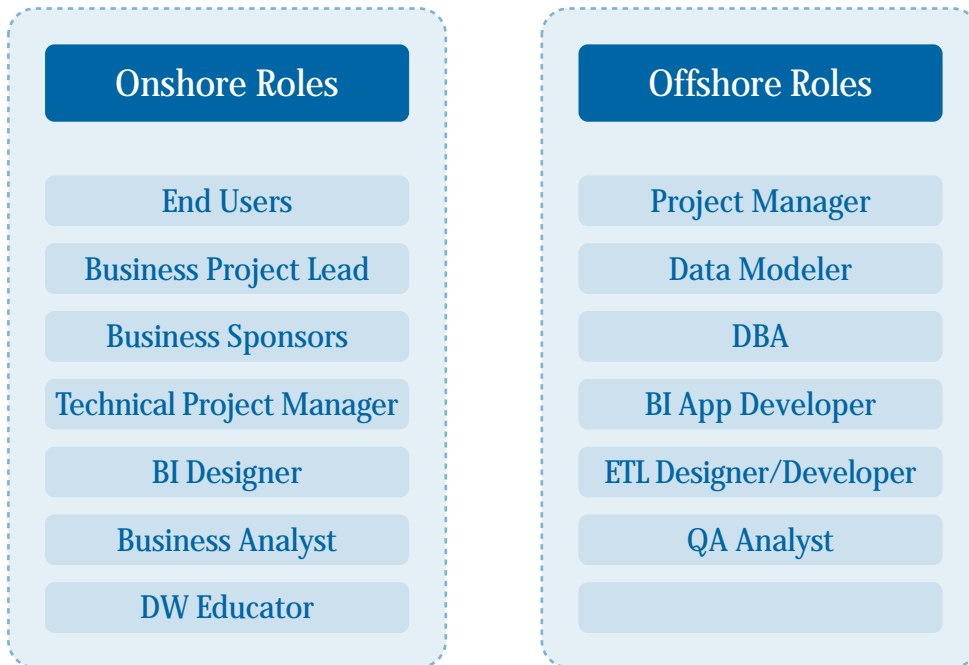
How does it all work?

How would resources be deployed between my work sites and my offshore provider's locations for a typical business intelligence project? What work is done onsite and which offshore?

As can be expected, those activities that require proximity to business users are the ones that are performed onsite. Requirements gathering, architecture and design activities at the beginning of a development cycle, and implementation at the end of the cycle are all activities that are mostly conducted onsite (with some offshore support). On the other hand, core development and testing activities, based on well communicated ETL or report specifications are all conducted offshore. Following is a rough guideline on the proportion of work that can be performed offshore, by phase:

Phase	% Offshore
Business Requirements	0%
Architect	30%
Design	50%
Develop	90%
Test	90%
Deploy	10%

The onsite/offshore distribution of the resources needed to work on these tasks for a business intelligence project is dependent on the size of the project, its complexity, the level of specificity in the requirements and the duration of the project. Generally though, the following distribution of roles is found:



How does distributed development work for a typical business intelligence project?

Let's assume that the decision to use a distributed model to develop your BI project has been made, and all the necessary due diligence, planning and organization described elsewhere in this FAQ has been done and the project has been kicked off to great fanfare. Now what? Here's one scenario for how it would work on a day to day basis:

Scenario

The onsite team for this onsite/offshore project for a medium-sized business intelligence project consists of a ½ FTE Project Lead, Technical Architect and Business Analyst. The offshore, India-based team consists of a Project Manager, two BI developers and one ETL developer. The entire development environment is in the US, setup in a sub-network within the company's main network. The India-based team accesses the development environment using a secure SSL based VPN.

For simplicity of illustration, the example below uses one BI report as the primary development task.

EST	Indian Standard Time (IST)	Activity
8AM	6:30PM	Conference call with onsite and offshore team to discuss requirements for new reports. The US PM and the Business Analyst lead the call, using a web session to display and discuss the requirements. The India team, having previously reviewed the written requirements posted on the project portal, asks questions to further clarify the requirements.
10AM	8:30PM	Indian team checks in with US Project Manager to ensure there aren't any urgent issues before heading home.
1PM	11:30PM	Technical Architect and Business Analyst log issues with reports under development on the project's on-line issue tracking system.
3PM	1:30AM	Business Analyst drafts requirements for new report and posts it on the project portal.
5PM	3:30AM	US PM checks in with US team to discuss priority issues that the India-team needs to handle.
7PM	5:30AM	US PM sends detailed email to India PM prioritizing tasks that need to be worked on. Tasks are logged in the issue tracking system also.
11PM	9:30AM	India team begins its workday, working on the report discussed yesterday, reviewing the requirements for the new report and issues logged in the system. The India PM discusses priorities with the offshore team.
12:30AM to 8AM	11AM to 6:30PM	Indian team continues to do develop and work on issues.
8AM	6:30PM	Onsite and offshore team have a conference call to review the newly developed report. The Offshore PM runs the report and shares it with the extended team in a web session. Issues with the report are discussed and logged. The next set of reports to be developed is discussed and assigned.

How do the offshore resources gain access to the development environment?

There are several modes under which an offshore team can gain access to the physical development environment. The choice is largely dependent on corporate standards and any policies concerning network access and data security. In most cases, the access is provided through a secure VPN network. The VPN options available include: Cisco VPN, Windows VPN, Citrix based technologies or HTTP based VPN's.

Once the offshore resources connect to the VPN, there is really no difference between an offshore developer and an onsite developer. The offshore resource can just use the client software to connect directly to the development Server for development and testing. Certain actions that can take up a lot of data transfer (e.g. Schema Updates) are best done through remote connectivity software like Windows Remote Desktop Client or PC Anywhere.

How can offshore resources perform their tasks if direct access to the development environment is not feasible or permissible?

A complete parallel environment is setup offshore. The offshore team needs to be provided with sample dimensional data and dummy fact tables. All development and testing is done offshore. For a reporting project, an onsite developer would be required to restore the metadata and to test/run the reports against the real data.

My organization has a specific development methodology and way of conducting business – how would distributed development accommodate this?

An organization's culture and specific processes will greatly influence the success of a distributed development initiative. For instance, a company that insists on significant interpersonal, face-to-face interactions will find it difficult to use offshore teams for any software development. Development processes do vary from organization to organization as well. Though an iterative methodology is preferable for BI development, some organizations use traditional waterfall methods. Levels of development maturity can vary as well (i.e. CMM 5 vs. CMM 3).

For distributed development to be successful, it is critical that the vendor and client discuss upfront each other's preferred processes. Most experienced vendors will align their methodologies to their client's. This however should be weighed against the project's requirements, since this alignment is likely to affect the project's budget, scope or schedule.

What do I need to consider when transitioning production BI projects to an offshore services provider?

Too often, much attention is paid to the evaluation, negotiation and finalization of contracts with onsite/offshore vendors, with little regard for how the project(s) will be transitioned. A formal transition plan is absolutely necessary to ensure that all tasks are properly transitioned according to schedule. All parties must have a clear understanding of their roles and responsibilities for the transition. At a minimum, a formal transition plan for migrating a live BI application to a distributed mode should have the following eight components:

1. **BI system "health" diagnostic** – This diagnostic should include an assessment of the technical environment, security requirements, resource availability, BI system use characteristics, technical performance, training needs, documentation and other elements critical to developing a successful transition plan.
2. **Communications plan** – Consider all constituents and communicate transition plans and "what to expect". The communications should include abstracts from the vendor contract including Service level agreement (SLA) terms and KPIs (Key Performance Indicators). All parties should be updated on transition progress no less than weekly.
3. **Staffing plan** – Complete plans required for onsite and offshore teams. The onsite project manager should interview all offshore team members prior to accepting them for the team.
4. **Technical infrastructure and cutover plan** – Assessment of the current architecture and any gaps that need to be filled to provide offshore support. Typically, there will be a time period during which redundant onsite and offshore support is provided prior to complete cutover to offshore support.
5. **Knowledge transfer plan** - Knowledge transfer activities may require that members of the onsite team work side-by-side with the onshore team for some period. A training plan and an Operations Guide should also be developed to communicate

knowledge to additional offshore team members.

6. **Security plan** – Especially for BI applications with sensitive data (i.e. customer data), there needs to be a plan to secure confidential data and information. The plan should include offshore background check practices and technical infrastructure requirements.
7. **“In-flight” issues plan** – How to handle pending support and development requests.
8. **BI system growth plan** – To assist with capacity planning, staffing and overall communication of the BI system’s “vision”, the business sponsors should communicate their expectations of how they expect the system to grow (i.e. number of users, additional data sources, additional reports, new applications, etc). At a minimum, this growth plan should feature a 12 to 18 month time horizon.

How do I get started?

Begin by clearly understanding and articulating your reasons for pursuing a distributed development initiative. The following tend to be the reasons that most organizations pursue distributed development for their BI and other IT projects:

- To save anywhere from 30% to 80% on labor costs
- To free up in-house resources for higher value activities
- To provide on-demand, as needed staffing
- To access a highly educated and skilled offshore workforce
- To access skill sets that are difficult to find domestically
- To accelerate development times by taking advantage of time zone differences

Once the organization understands why it is interested in using an onsite/offshore model, a business case should be developed. Some elements often missed in business cases are extra, hidden costs such as transition, travel, infrastructure, software, communications, and redundancy related costs.

Next, contact potential vendors and conduct the necessary vendor due-diligence, based on your organization’s goals and the decision criteria outlined elsewhere in this FAQ. Make sure that the vendor has the BI expertise you need for your projects. Many IT consulting companies

are either skilled at BI project delivery, or at offshore software development, but only a few have mastered both.

Following the selection of your chosen vendor and the necessary contractual negotiations (including communications plans, processes and risk mitigation plans) comes the important task of selecting the project (or pilot) most appropriate. Regardless of whether it is a project or a pilot, it must be of a significant enough size to assess the appropriateness of distributed development for your organization, given your overall goals. The initial project will also give you the opportunity to understand and fine-tune mutual processes and dynamics. Most will recommend that you start with something small, but make it meaningful.

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