



Implementing Global Development



*Insights into the challenges and skills
required to successfully integrate off-
shore development*

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Introduction

One of the most significant changes in the software development industry over the last decade has been the ascendance of “off-shore” firms providing development, maintenance, and/or Business Process services. During this period, companies in first-world economies have rushed to exploit the promise of low cost overseas labor with varying success. This trend continues at an accelerated rate today, and is an increasingly common aspect of large-scale software development efforts.

In this paper we describe the Global Development Model (GDM), highlight the challenges inherent in its implementation, and summarize the skills and capabilities firms and individuals must have to successfully embrace it. We identify the major areas of risk and propose several mutually compatible means to address them.

We will consider several important aspects of the GDM, including:

- Major Deliverables produced throughout the lifecycle
- The interfaces between phases and activities in the Project Lifecycle
- The geographic distribution of work
- The challenges inherent in distributing work to remote locations
- The (potentially dynamic) distribution of staff
- The necessary skills required by staff within each phase of the Software Development Lifecycle (SDLC)
- The preparation of staff for productive participation in global Projects
- Control mechanisms to insure the completeness and correctness of Deliverables
- The role of a Project Management Office (PMO) in the GDM

We expect that the analyses and conclusions we present will be of interest to:

1. Firms seeking to partition their software development processes into local and remote venues
2. Firms seeking to improve their global Software Development Model
3. Software contract firms seeking international clients
4. Individuals seeking IT positions in the highly competitive global software development landscape.

A Glossary of Terms has been provided as a convenience at the end of the document.



Executive Summary

Global software development, defined as a geographically dispersed Software Development Lifecycle (SDLC) remains an increasing trend motivated largely by low-cost technical labor in certain remote countries.

Successful implementations of the Global Development Model (GDM) in which portions of the lifecycle are conducted in remote locations, potentially require new skill sets within various phases of the SDLC. Organizations that underestimate or ignore the unique challenges involved in partitioning the SDLC often fail to realize the potential savings that originally motivated a global approach.

Challenges inherent in the implementation of the GDM potentially include:

- A shortage of staff proficient with target skill sets
- A shortage of staff proficient in the target language
- Information loss and/or miscommunication due to Project Team dispersal
- Lost or redundant work resulting from the ineffective transfer of Deliverables across venues
- Wage inflation that erodes cost-efficiencies and makes productivity especially important to realizing anticipated cost reductions

Potential ways to mitigate the risks inherent in a GDM implementation include:

- A carefully designed training program to enhance the capabilities of the organization to meet GDM challenges
- A centralized, appropriately empowered Project Management Office to facilitate the adoption of the GDM by providing a standardized template-based software development process.
- The dynamic migration of staff between local and remote venues to ameliorate communication issues and enhance knowledge transfer

In addition to the above, experience has shown that a standard process is possible only with strong support from executive management.

The key to achieving a quality when implementing the Global Development Model is to focus the organization's energy on those Deliverables that pass between local and remote venues. *Special care must be taken to insure that transferable Deliverables are complete, correct, fully documented, and fully understood.*

To this end, Deliverables should be produced by *diverse sub-teams* that include membership from upstream producers and downstream consumers.

In addition, cross-venue Deliverables must be subject to rigorous review by the appropriate Stakeholders, with a special emphasis on completeness, accuracy, and sufficient knowledge transfer.

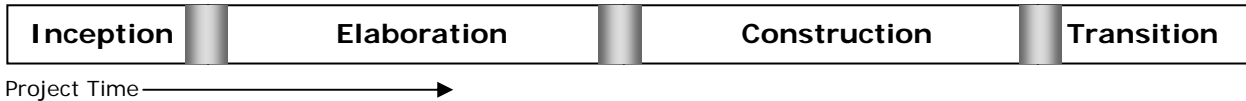
Affinity IT Training has been providing technical training services to clients since 1993, and is a trusted resource in preparing geographically distributed Project staff for their roles in global development scenarios. We hope that this document clarifies some of the challenges facing firms engaged in global development and illuminates potential solutions. Please contact us to discuss your software development challenges at feedback@affinity-it.com.



Exposition of the Global Development Model (GDM)

An implementation of the Global Development Model (GDM) can be envisioned as a partitioning of the familiar Software Development Lifecycle (SDLC), as illustrated in Figure 1. Many models for development exist; this model recognizes the four phases of the Rational Unified Process (RUP) ¹:

Figure 1: SDLC as RUP Phases



Each of the four phases are summarized below:

- Inception: This involves activities relating to the motivation, justification, and expectations surrounding a software development Project.
- Elaboration: This encompasses Requirements Gathering and Project Planning.
- Construction: This entails the implementation of Requirements.
- Transition: This involves Cutover and the disciplined termination of the Project.

A GDM implementation of the software development process entails one or more portions of the SDLC being conducted “remotely”, typically in another country characterized by less expensive labor. Generally, but not necessarily, it is the Construction phase that occurs remotely. Usually, this is the result of an economic decision that seeks to exploit disparity in labor costs across countries.

Since “local” and “remote” are relative terms, we will assume (for the purposes of this document) that “local” represents proximity to End-Users, and “remote” represents proximity to Development staff. We will use the terms “Stakeholder Venue” and “Construction Venue” for these locations respectively. In diagrams, we will use color to distinguish the venues as follows:



Note that the rightmost diagram depicts a gradual transfer of participation from the Stakeholder Venue to the Construction Venue. A similar diagram could be drawn to depict a transfer in the opposite direction.

Different implementations of the GDM include the following scenarios:

1. A multi-national firm conducting one or more portions of the SDLC (e.g. Construction) in foreign countries.
2. A firm contracting a portion of the SDLC to an external firm in another country.

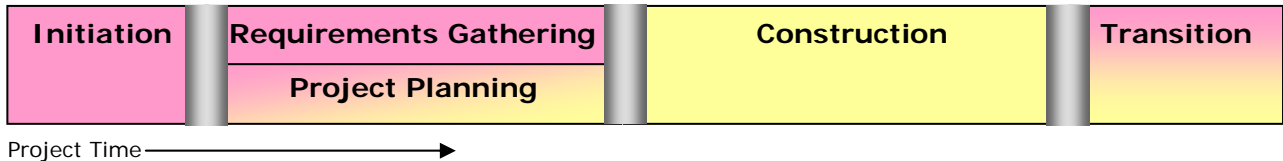
¹ See *The Rational Unified Process Made Easy*, Kroll and Kruchten, Addison Wesley, ISBN: 978-0321166098



3. A consulting firm charged with carrying out one or more aspects of the SDLC on behalf of clients.²

We will now refine our representation of the SDLC to distinguish those portions that might be carried out in remote locations. Figure 2 depicts a colorized SDLC in which the location at which various activities are performed is shown:

Figure 2: GDM Phases By Location



Note that the diagram depicts Scenario #1 above, and that we have replaced Elaboration with its constituent activities for clarity.

The rationale for this delineation is elaborated below:

- Initiation: This activity is typically conducted in close proximity to the Stakeholder Community.³ This work is typically driven by Project Management staff and requires broad Stakeholder participation and endorsement.⁴ Although Development staff may participate in this phase, this activity is usually conducted at the Stakeholder Venue.
- Elaboration: Requirements Gathering is typically conducted as close to End-Users, their managers, and other Stakeholders as possible. Project Planning is typically conducted by Project Management staff at their respective locations, which in this case includes both the local and remote locations.⁵
- Construction: Implementation typically occurs remotely from other activities in the GDM scenario.
- Closure: The disciplined termination of the development Project entails several activities that are conducted in all locations.

Challenges in Implementing the Global Development Model

Unfortunately, there are many ways in which an organization can stumble when it attempts to partition the SDLC. Furthermore, this is not the exclusive domain of first-timers— many firms experienced in off-shore development stubbornly continue to make the same mistakes and suffer the consequences. Some of the surprises and pitfalls that a firm may encounter are elaborated below:

² This is actually just the “other side” of the previous scenario, but is a valid and distinct perspective in itself.

³ We consider a Stakeholder to be an individual who will be involved, who may be impacted, or who can influence the development Project and/or its success.

⁴ “Endorsement” is understood to mean the review and comprehension of the artifact by the Stakeholder Community, as evidenced by a review process culminating in broad management signoff.

⁵ This description deliberately over-simplifies the two distinct activities inherent in Requirements Gathering: 1) Understanding and documenting needs, and 2) Creating Functional specifications of what the solution system must do.



- Partitioning the SDLC represents an increase in process complexity. An existing process that is flawed or sub-optimal will certainly not be improved magically by relocating it to a foreign venue. It is far more likely that implementing *the GDM will exacerbate existing problems and expose additional flaws in your process.*
- Partitioning your process represents Organizational Change (OC), which is not a traditional strength of IT organizations. Even a strong existing software development process may be damaged if the partitioning is not handled well from the OC perspective.
- A key aspect of implementing the GDM is the transfer of Deliverables between venues. Each such transfer represents an opportunity for *information loss, miscommunication, and loss of intellectual continuity.*
- Your firm is probably not the first to “discover” the remote venue, and is likely to be only one of many firms competing for talent there. As a result, there is often a *shortage of qualified workers* in the Construction Venue. Note that this technical expertise as well as Project Management expertise. This labor shortage problem is often particularly acute with respect to middle management positions.
- Depending on the venue, there may be a *shortage of workers proficient in the Target Language.*
- Retaining workers in booming foreign markets can be a challenge, as firms compete for the best talent.
- There are often delays in obtaining visas for workers, resulting in *problems implementing desired staff flows.*
- In addition to the above “short term” issues, *wage inflation* can steadily erode the economic advantages of the Construction Venue as time progresses.

We note with some satisfaction⁶ that while some of these problems, such as wage inflation, cannot be addressed by the firms facing them; others are directly addressable through well-designed Project Management and training initiatives.

Meeting the Challenges of Global Development

A number of mutually supporting tactics can be suggested to help avoid classic GDM pitfalls and realize anticipated cost-reductions. A list appears below and each is subsequently elaborated in its own section:

- Institutionalize a standard template-based development process for GDM projects
- Establish a centralized and appropriately empowered Project Management Office to facilitate the design and adoption of a standard process
- Prepare staff to utilize your process, training them to insure they possess the critical skills for their role(s)
- Focus special attention on the quality of Deliverables that transition between venues
- Institute strong Change Control Procedures for GDM Projects
- Migrate key staff between venues to improve knowledge transfer and maintain intellectual continuity
- Institute a strong Continuous Process Improvement paradigm

⁶ Affinity IT, LLC provides IT Training in programming technologies and Project Management ©. See www.affinity-it.com for a full course catalog, and contact us to discuss your challenges.



GDM Deliverables and Interfaces

We have identified the transition of Deliverables between local and remote venues as a potential source of problems in GDM Projects. In this section we describe the key Deliverables created during each Project phase, focusing on those that are transferred between local and remote locations.

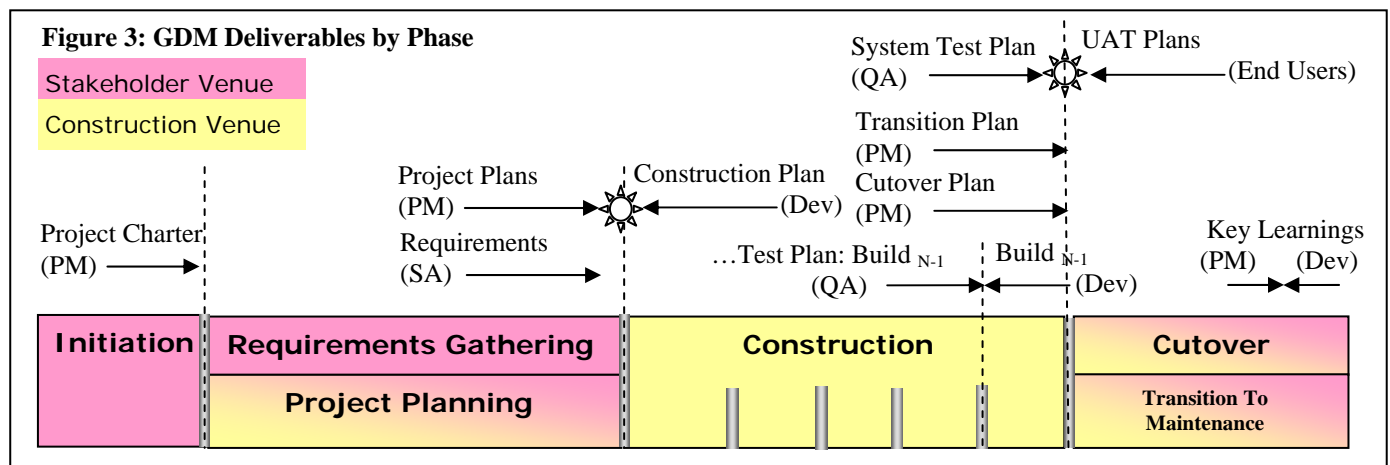
Figure 3 depicts the transfer of Deliverables between local and remote locations. For clarity, the parties responsible for each deliverable are also identified. As in previous diagrams, "Project time" generally proceeds from left to right, although cyclical relationships between producer and consumer are not explicitly shown.

In a properly managed effort, the Deliverables shown in Figure 3 represent "Stage Gates" within their respective phase, with approved versions of the artifacts acting as demonstrable milestones and pre-conditions for subsequent work. We see this artifact set as being the minimal necessary to properly control an implementation of the GDM.

Each of the Deliverables and the strategic value it provides is elaborated below:

Project Charter

The Inception phase of a Project culminates with the broad endorsement of the Project Charter by the Stakeholder Community. This document is produced by Project Management staff and provides a necessary foundation for the Project. Specifically, this document describes the motivation for the Project, establishes the business case that justifies it, and defines clear measures of success. In addition, the document identifies the Stakeholder Community as well as the high level responsibilities of all individuals and groups with respect to the Project.



Requirements

Requirements consist of one or more documents describing the various features, capabilities, and constraints that must be present in the Solution System, including its functional behavior, performance, user interface, compatibility, environmental, and regulatory aspects. Ideally, Requirements are typically authored by Systems Analysts possessing considerable knowledge of the problem domain, potential solutions, and relevant technologies. Requirements require diligent verification and broad endorsement by the Stakeholder Community prior to the commencement of the Construction phase.



Project Plans

"Project Plans" is a broad term for those documents and Deliverables that specify the procedures, timing, and responsibilities for all aspects of the Project including: Time and Budget Estimates, Project Schedule, Resources, Communication, Status Reporting, and Change Management. These plans are produced by Project Managers in consultation with staff from other roles and phases. All plans require broad endorsement by the Stakeholder Community. Note the distinction between these Deliverables and the Construction Plan.

Construction Plan

Construction is carried out as a sequence of cycles through which the Solution System is *incrementally implemented*. Each cycle produces a "build" of executable code that is fully integrated with previous builds and that can be tested. The Construction Plan is the portion of the Project Plan that details the timeframe, resources, and scope of each cycle, including the specification of which features comprise each build. Construction Plans must be produced by the part of the organization responsible for Solution System Development. It is essential that Construction Plans are consistent with other Project Plans, particularly the Project Schedule. Note that there is often tension at this boundary due to the different perspectives and responsibilities of the Development and Project Management organizations. The negotiation of mutually acceptable terms and the ultimate integration of all Project Plans provide a common understanding of how and when the Solution System will emerge from Construction.

System Test Plan

A System Test Plan consists of one or more documents detailing how the Solution System will be exercised to insure compliance with the statement of Requirements. This specification is typically authored by staff representing the Quality Assurance portion of the organization and is based on Requirements. Actual System Testing is conducted by QA staff during the Cutover phase and satisfaction is a prerequisite for deployment (i.e. Cutover) of the Solution System into production.

User Acceptance Test (UAT) Plan

A User Acceptance Test Plan consists of one or more documents detailing how the Solution System will be tested by the End-User community prior to deployment into Production. UAT is typically less comprehensive than System Testing but is accomplished with lifelike data⁷ and focuses on system features most critical to End-Users. UAT often entails running the Solution System in parallel with legacy systems to prove correctness and provide assurance to the End-User community.

Test Plans

Each build has an associated Test Plan specifying the testing that must be conducted to determine that the build is compliant with the Solution System Requirements. The System Test plan may be a superset of the Test Plans associated with each build.

Builds

The Construction phase produces a sequence of partial implementations of Requirements, each of which is termed a build. Each successive build is a superset of

⁷ That is, as similar to the production environment as is feasible.



previous builds and is tested as such. Each build consists of a partial implementation of all Deliverables including executables, documentation, training materials, etc.

Transition Plan

A statement of the Deliverables and process by which development responsibilities will be transferred to maintenance staff, as well as metrics to determine that the transfer has occurred successfully.

Cutover Plan

A statement of the Deliverables and process by which the Solution System will be deployed to the production environment, including a description of whatever User Acceptance Testing will be conducted. This often includes a detailed schedule and specific roles and responsibilities necessary for Solution System deployment. A Cutover Plan is produced through the collaboration of Project Management and Development staff.

Key Learnings

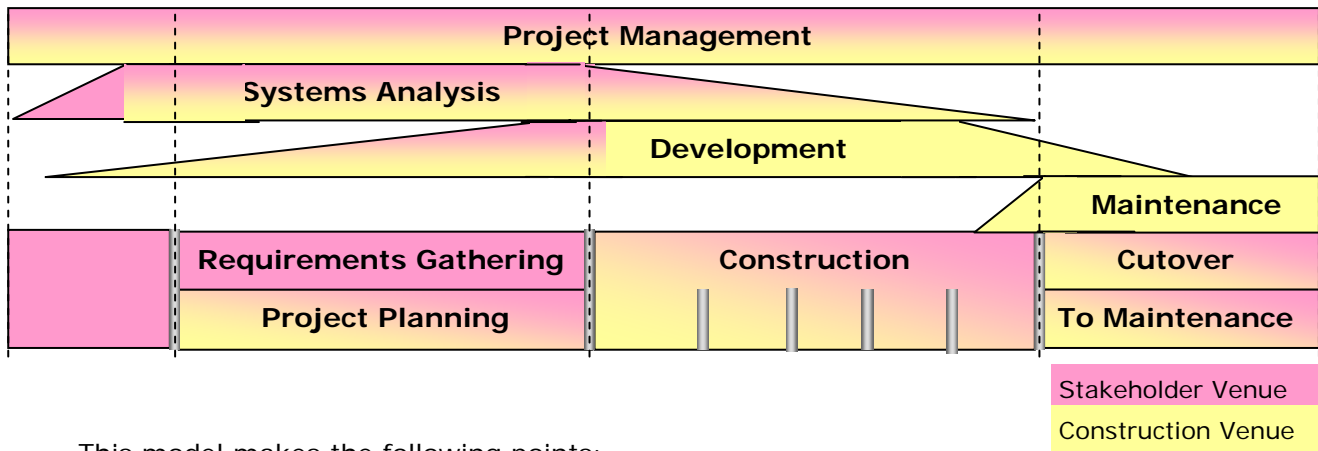
A document elaborating the lessons learned throughout the Project, largely (but not necessarily solely) based on one or more Project Review meetings conducted during the Transition phase.

GDM Staffing Model

Another potential pitfall that can compromise a GDM effort is the miscommunication, and information and knowledge loss-age⁸ that can occur as Deliverables are transferred between venues. To minimize damage due to transference between venues, we must consider the ideal staffing model for a GDM Project.

Figure 4 illustrates an ideal model of the relative participation of each organizational role throughout the SDLC.

Figure 4: GDM Staffing Model



This model makes the following points:

- Project Management staff participate throughout the entire SDLC, peaking in expended effort during Project Planning.
- Systems Analysts are involved in the development of the Project Charter, grow to peak representation during Requirements Gathering, and ramp-down throughout construction.

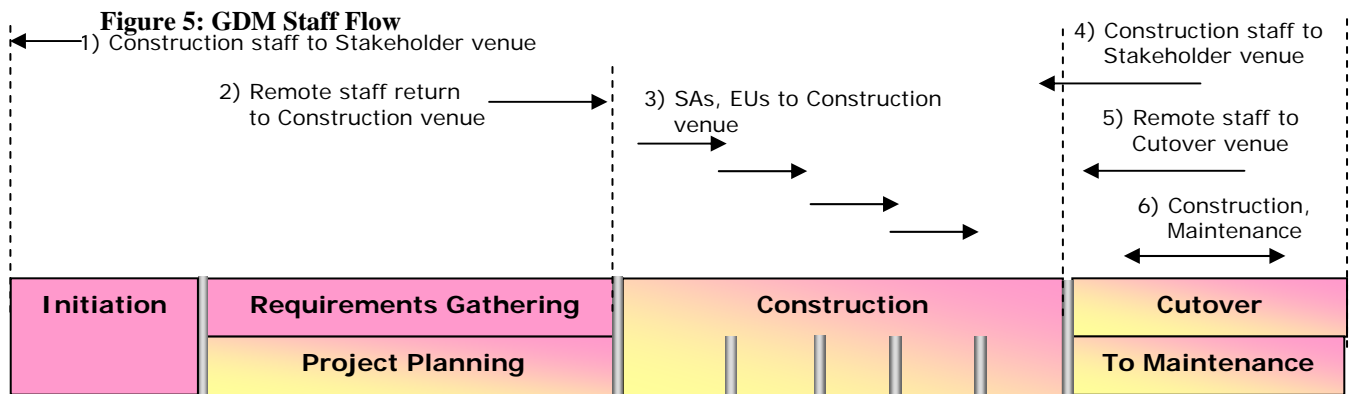
⁸ Information is that which is documented, whereas knowledge is known but remains undocumented.



- Development participates in various capacities in the entire SDLC, but is largely conducted remotely from Requirements Gathering.
- Maintenance staff have sufficient overlap with Construction to become proficient in advance of Transition, but maintenance occurs remotely.

In addition to the relative participation by phase, we also have to consider an important additional dynamic in the successful implementation of the GDM: the location at which staff conduct their work.

The following diagram illustrates the potential flow of staff between local and remote locations as the SDLC progresses.



This model illustrates the temporary migration of staff between venues necessary to insure success in the partitioned SDLC. Specifically note that:

- 1) Key Construction staff are relocated to the Stakeholder venue from the earliest stages of the effort. Relocated Construction staff participate in Requirements Gathering and Project Planning, resulting in better familiarity with the problem domain and Stakeholder Community. This minimizes discontinuity during the transition of the Project Charter and Requirements to Construction.
- 2) A portion of the relocated Construction staff return to the Construction venue when Construction begins. This provides knowledge transfer between the local and remote locations above and beyond document transfer.
- 3) System Analysts and End-Users travel to Construction venue by cycle for review and testing of incremental builds. This results in the faster detection and resolution of problems as End-Users and Systems Analysts get an earlier view of the nascent Solution System as it emerges from Construction.
- 4) Construction staff may return to Stakeholder venue for System Testing, User Acceptance Testing, and system deployment during Cutover phase. This insures sufficient expertise is on hand to detect and correct bugs quickly.
- 5) Construction staff may visit the deployment venue to participate in Cutover. This increases expertise and provides insurance for a smooth installation.
- 6) Prior to Transition, Maintenance staff may migrate to the Construction Venue to accelerate their preparation; following Transition, Construction staff may



migrate to the Maintenance venue to insure continuity and a smooth transition of responsibilities.⁹

Effective Change Control

An effective Change Control Process will specify the procedures and personnel used to keep a Project under control despite changes that might occur to the Requirements, Schedule, or any other aspect of the Project. Change Control does not prevent or prohibit change but rather describes the process by which modifications to existing Project Plans and Scope are reconciled into new plans.

A Change Control Process should be integral to every Project, but is critical to a GDM Project because the additional complexity of remote venues.

Critical Skills in Global Development

Clearly, a successful implementation of the GDM requires an organization to possess a diverse skill set. As was mentioned earlier, one of the challenges often faced by GDM Project Managers is the lack of sufficiently skilled staff. As one would expect, the skills required vary by role within the Project. In Table 2 we consider requisite skills by role, and also reflect the relative degree of proficiency desired.

We believe it is extremely beneficial for all staff to have basic language proficiency with the “local” (i.e. Stakeholder Community) language. All Project artifacts should be expressed in this Target Language. In addition to Target Language proficiency, all Stakeholders should be familiar with basic Project Management and the GDM. To this we add the following idealized list:

Table 2: GDM Requisite Skills By Role

Role	Basic Proficiency	Moderate Skill	Strong Expertise
All Stakeholders	Target Language Project Mgmt/GDM Communication		
Project Mgmt	Problem Domain Production Environment		Target Language Project Mgmt/GDM
Systems Analysis		Project Mgmt/GDM	Problem Domain Target Language Communication Requirements Capture
Development		Project Mgmt Problem Domain	Relevant Technologies Production Environment
Quality Assurance		Target Language Problem Domain	Quality Assurance
Maintenance		Problem Domain	Relevant Technologies
End-Users	Requirements Capture		Target Language Problem Domain

Each skill is elaborated below:

- Target Language: The ability to read and converse in the native language of the End-Users and Stakeholder Community. This is often a bottleneck for firms seeking to grow their business and is seen as a key skill for all members of the organization.

⁹ Clearly, these staff flows are beneficial only when the Construction and Maintenance venues are different.



- Project Management/GDM: An understanding of the process of software development, including the phases and Deliverables involved. This must include an appreciation for the management of such efforts, including Project phases, Deliverables, milestones, and metrics. Basic proficiency is seen as a key skill for all members of the organization to provide insight and motivation into the various activities and Deliverables used to orchestrate and control the Project.
- Communication: This encompasses interviewing skills, presentation skills, interpersonal effectiveness, and writing ability. This skill set must be augmented by adequate technical knowledge for those roles that require it. This is important for all members of the organization, but is especially critical for Systems Analysts and Project Managers.
- Problem Domain: Simply put, this means having a sufficient understanding of the End-User's goals, business needs, and operational constraints. It includes an in-depth understanding of what the End-User is trying to do and why. This also encompasses a complementary appreciation for the End-User's organization at all applicable levels. The greater the familiarity with the client's Problem Domain, the more capable the organization is to service their needs. Clearly, an in-depth understanding of the Problem Domain is crucial for Systems Analysts.
- Production Environment: Familiarity with the software environment (Operating System, Database, peer Systems etc.), interdependencies, as well as relevant organizational insight.
- Requirements Capture: This describes the ability to conduct research, interview Stakeholders, and otherwise discover, document, and verify Solution System requirements. This capability lies at the heart of Systems Analysis.
- Relevant Technologies: This is deliberately vague due to the diverse nature of technologies, but is understood to encompass those programming languages, database systems, development tools, and operating systems that are in scope for the Project at hand.
- Quality Assurance: This encompasses the skills necessary to analyze (existing) Requirements, author Test Plans, and conduct tests in order to demonstrate compliance with Requirements. An adequate understanding of the SDLC helps expedite build cycles, System Testing, and User Acceptance Testing.

Preparing Staff for Global Development Projects

A comprehensive training program can be designed to enhance the capabilities of the Project Team and delivered globally to all necessary staff. In addition to training and Workshops, a hands-on Integrated Case Study can be added to simulate the evolution of a Project through the partitioned SDLC, featuring the creation and transition of Deliverables between venues.

The chart presented in Figure 6 maps the phases of the SDLC to various courses providing the critical skills we have previously identified.



Figure 6: Training Options By GDM Phase

Initiation	Requirements Gathering	Construction	Cutover
	Project Planning		Transition
Implementing the Global Development Model			
Project Charter Workshop	Discovering and Documenting Use Cases		
	Writing Effective Requirements	Relevant Technical Topics	
	Writing Effective Test Plans		Project Review Workshop
	Estimating and Scheduling Workshop		
	Communication Planning Workshop		
	Risk Management Planning		
	Introduction to Microsoft Project		
	Requirements Review Workshop		
	Planning and Managing Software System Transition		
Facilitating Productive Meetings			
Time Management			
Presentation Skills			
Language Skills			

Legend: Project Skills Technical Skills Professional Skills

Collectively, this framework represents a training curriculum supporting the Global Development Model, providing managers with options to enhance the performance of their staff. Obviously, not every Project needs the full set, and *one of the challenges facing managers is to architect a global training program representing the optimal cost/performance tradeoff for their Project.*

Table 1 summarizes our recommendations by mapping training options to GDM Project Roles.



Table 1: GDM Training Recommendations By Role

Course	PM	SA	Dev	QA	EU	Maint.
Project Charter Workshop	√	√	√			
Implementing the GDM	√	√	√	√	√	√
Writing Effective Requirements	√	√	√			
Estimating and Scheduling Workshop	√		√			
Communication Planning Workshop	√					
Risk Planning Workshop	√					
Microsoft Project	√		√			√
Requirements Review Workshop	√	√	√	√	√	√
Relevant Technical Topics		√	√			√
Planning and Managing Software Transition	√		√			√
Discovering and Documenting Use Cases		√	√	√	√	√
Project Review Workshop	√					
Facilitating Productive Meetings	√	√	√	√	√	√
Time Management	√	√	√	√	√	√
Presentation Skills	√	√	√	√	√	√
Language Skills	√	√	√	√	√	√

Legend:

Optional	Suggested	Strongly Suggested
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In designing a Training Program for GDM staff, the following considerations apply:

- The design of a comprehensive Training Curriculum should account for staff experience and the current capabilities and maturity of the organization. Too little coverage of topics leaves staff less than fully prepared for their roles. Excessive coverage represents inefficient use of training budget.
- Any Training Program can also be augmented with an Integrated Case Study (ICS) component that challenges participants to solve a non-trivial, domain-relevant software development problem. In a Global Training Scenario *a single ICS can be evolved through the entire SDLC, passing Deliverables between "local" and "remote" venues.*¹⁰
- "Workshops" can be extended to allow participants to investigate and produce "real world" deliverables. The appropriate timeframe depends on the complexity of the Project. Such deliveries should be viewed as an amalgamation of training and mentoring.
- We recommend all training be delivered in the Target Language to further enhance operational proficiency of all participants.

¹⁰ In fact, this is a core competence of Affinity IT, LLC



Project Quality Assurance

Consistently high Project Quality is achieved through a standardized software development process that is planned, executed, and controlled by Project Management. A “standard” software development process is one that:

- Is well understood and used consistently within the organization.¹¹ A standard process will feature certain Milestones and Deliverables that must be produced by every Project.
- A standard process is often “template-based”, meaning that the Project Team is provided with examples of previously completed Deliverables as well as empty templates.

Experience has shown that a Standard process is possible only with strong support of executive management. Corporate support for a standardized software development process often takes the form of an empowered and centralized Project Management Office (PMO). An effective PMO can facilitate the design and implementation of a common template-based process featuring well-defined Stage Gates and Deliverables.

The GDM embodies risks not found in localized Projects. Another key to achieving quality when implementing the Global Development Model is to focus the organization’s energy on those Deliverables that pass between local and remote venues.¹² *Special care must be taken to insure that transferable Deliverables are complete, correct, fully documented, and fully understood.*

To minimize disharmony, Deliverables should be produced by *diverse sub-teams* that include membership from upstream producers and downstream consumers.

Cross-venue Deliverables must be subject to rigorous review by the appropriate Stakeholders with special emphasis on completeness, accuracy, and adequate knowledge transfer.

As with all reviews, detected problems need to be analyzed to determine the root cause and solution options. Significant problems may be handled by Project Management through a Change Control Process.

Benefits of a Project Management Office (PMO)

The existence of a Project Management Office (PMO) can facilitate the implementation of the Global Development Model in several ways. Specifically, a PMO can:

- Standardize terminology, methodology, Deliverables, and reporting
- Provide expertise and internal consulting in the planning and ongoing management of GFM Projects
- Provide a single consolidation point of status for upper management
- Provide a multi-location perspective of GDM Projects
- Facilitate the provision of training of staff in the appropriate aspects of Project Management

¹¹ Note that even a standard process must be flexibly adjusted to the scale and specific characteristics of each Project.

¹² Recall that Figure 3 provided us with a view of Deliverables throughout the SDLC.



The benefits of a standardized process and template-based Deliverables are numerous, and include the ability to leverage staff more effectively, achieve higher process quality, and (most importantly) produce better Project outcomes. A PMO also represents a repository of collective Project Management expertise that can be a strategic resource internally as well as a source of competitive advantage for the firm.

Continuous Process Improvement

As with any ongoing endeavor, it is important to objectively evaluate the successes and failures experienced by each Project and attempt to institutionalize Best Practices and eliminate counter-productive behaviors. The Project Review provides an opportunity to collect important insights, and it should be integrated into every Project. Specific recommendations should be required of Project Managers. The Standard Process should then be periodically adjusted to reflect the collective insights of previous Project Reviews.

Conclusion

The Global Development Model (GDM) has been shown to be an ongoing and increasing trend in large-scale software development. Successful GDM implementations potentially require new and diverse skill sets within various portions of the SDLC. Organizations that underestimate or ignore the unique challenges involved in partitioning the SDLC often fail to realize the potential savings that motivated a global solution to start with. We have examined the risks inherent in GDM software development and presented specific strategies to address them.

These strategies include:

- The adoption of a standard template-based development process for GDM projects that devotes special attention on the quality of Deliverables that transition between venues
- The delivery of a customized global training program to insure both local and remote staff possess the critical skills needed to be optimally effective in their role(s)
- The migration key staff between venues to improve knowledge transfer and maintain intellectual continuity
- Strong Change Control Procedures
- A strong Continuous Process Improvement paradigm



Affinity IT, LLC

Affinity IT Training has been providing technical training services to clients since 1993, and is a trusted resource in the preparation of Project staff for their roles in the global development.

Specifically, we can provide:

- Global training services to local and remote venues to address skill gaps.
- Deliver custom Project simulations to global staff
- Consulting services to assist in the creation of a Project Management Office
- Consulting services to assist in the creation or enhancement of standard template-based processes

We hope that this document has clarified some of the challenges and potential solutions facing global development firms. Let's discuss the challenges facing your organization.

We can be reached at feedback@affinity-it.com, and additional information about our training courses and services can be found at www.affinity-it.com.



Appendix A: Glossary of Terms

Term	As Used In This Document
<i>Change Control Process</i>	A specification of the means by which changes to the Project will be recognized, analyzed, resolved, and communicated.
<i>Closure</i>	The last stage of a software development Project in which Cutover occurs and the Project is terminated.
<i>Construction</i>	The implementation of the Solution System.
<i>Construction Venue</i>	The office location(s) in which Developers reside and at which the majority of Construction will occur.
<i>Cutover</i>	The deployment of the Solution System into production.
<i>Deployment</i>	All steps required to accomplish the transfer of the Solution System to production, making it accessible to End-Users.
<i>Elaboration</i>	The second phase of a Project in which Requirements are gathered, documented, and verified, and during which planning occurs. Deliverables include Requirements and Plans.
<i>End-Users</i>	Individuals that will utilize the Solution System when it is deployed.
<i>GDM</i>	See Global Development Model.
<i>Global Development Model</i>	An implementation of the Software Development Lifecycle in which one or more key phases are conducted remotely, typically in another country.
<i>Global Training Scenario</i>	The delivery of a custom curriculum to the geographically distributed staff of a global organization focused specifically on the transfer of Project Deliverables between local and remote venues.
<i>Initiation</i>	The first phase of a Project in which the Project Charter is created.
<i>Integrated Case Study (ICS)</i>	A non-trivial domain-relevant assignment that simulates a Project spanning one or more phases of the SDLC. The goal is to challenge participants to utilize their new skills and provide Project Deliverables suitable to their Project role. In a Global Training Scenario, Deliverables are passed between groups and locations to simulate the actual Project Management and Development of a Solution System.
<i>Project Charter</i>	Foundational document produced by Project Management for the benefit of the Stakeholder Community and Project.
<i>Project Lifecycle</i>	The full duration of a Project from start to finish, encompassing the following well recognized phases: Initiation, Planning, Execution, and Closure.
<i>Project Management</i>	The effort and staff responsible for the planning, execution, and control of the software development Project.
<i>Project Management Body of Knowledge (PMBOK)</i>	Well recognized publication of the PMI (see below) that details best practices in Project Management.
<i>Project Management Institute (PMI)</i>	Private organization that publishes and evangelizes PM standards and techniques. See www.pmi.org .
<i>Problem Domain</i>	The business environment and processes that the Solution System supports.
<i>Quality Assurance</i>	The process and staff responsible for insuring that the Solution System meets customer needs as expressed in the Requirements.
<i>Requirements</i>	Specifications detailing all aspects of system appearance, characteristics, and behavior, including: functional, performance, compatibility, regulatory details.
<i>Requirements Capture</i>	The process by which Solution System Requirements are discovered, documented, and verified.
<i>SDLC</i>	Software Development Lifecycle



<i>Software Development Lifecycle</i>	The full spectrum of time and activities associated with the analysis, design, implementation, and delivery of applications.
<i>Solution System</i>	The primary deliverable being created by the Project.
<i>Standard Process</i>	A software development methodology for software development that is both well understood and consistently employed by the organization. A standard process typically features required milestones, deliverables, artifacts, and reports.
<i>Stakeholder Community</i>	The broadest possible audience associated with, effected by, or potentially impacting the Project.
<i>Stakeholder Venue</i>	The office location(s) in which End-Users reside and in which most of the Stakeholders can be found. In a geographically dispersed Project, this might be considered to be a region or country.
<i>System Test</i>	Quality Assurance Process by which a Solution System is deemed to be consistent with Requirements and suitable for release to End-Users.
<i>Target Language</i>	The predominant language used by End-Users in the Stakeholder Venue
<i>Template-based Process</i>	A process that incorporates empty standard documents to be completed throughout the process lifecycle. Typically, both empty and completed documents are provided to Project Teams to boost their productivity, improve quality, and achieve compliance with a Standard Process.



Appendix B: GDM Training Course Descriptions

The following table (Table 3) summarizes the various courses that can be combined to meet the specific needs of the Project at hand. Delivery times should be adjusted to match the complexity of the Project, organizational maturity with Global Development, and the skill levels of staff. In addition, workshops can be designed to produce Project Deliverables. Finally, note that language proficiency can be accelerated by delivering all other training in the Target Language.

Table 3: GDM Training Course Descriptions

Course Title	Course Description	Minimum Duration*
<i>Implementing the Global Development Model (GDM)</i>	Suitable for the entire Project Team , this presentation is designed for a broad audience, and provides a high level examination of the SDLC, the GDM, and the Project Lifecycle. It describes the Project Management mechanisms and Deliverables used to plan, monitor, and control GDM Projects.	1 Day
<i>Project Charter Workshop</i>	Suitable for Project Managers and Systems Analysts , this is an interactive workshop in which participants are prepared to author a Project Charter by studying its purpose, content, and the process used for discovery, documentation, and verification.	1 Day
<i>Writing Effective Requirements</i>	Suitable for Systems Analysts , this course prepares participants to author Requirements documents. Coverage includes interviewing techniques, tests for completion, and verification techniques. An overview of Use-Case Analysis and a walkthrough of a Requirements Document Template is included.	1 Day
<i>Discovering and Documenting Use Cases</i>	Suitable for Systems Analysts , this course prepares participants to document Functional Requirements using Use-Case Analysis by studying the process by which Actors, Goals, and Scenarios can be discovered, evolved, documented, and verified.	1 Day
<i>Writing Effective Test Plans</i>	Suitable for Systems Analysts and Quality Assurance staff, this course prepares participants to utilize Requirements and Use-Cases to design and document tests and procedures that result in provably correct implementations.	1 Day
<i>Estimating and Scheduling Workshop</i>	Suitable for Project Managers and Senior Developers , participants will utilize the concepts, techniques, and tools used to discover work, estimate duration, discover dependencies, assign activities, and to document and communicate the above information effectively. An accelerated introduction to Microsoft Project can be incorporated into the course. (Adds 1 Day)	2 Days
<i>Communication Planning Workshop</i>	Suitable for Project Managers , this course prepares participants to plan the transfer of information within and out of a Project. Stakeholder identification, document and information analysis, and communication options are discussed. Means for measuring the effectiveness of communication within a Project are discussed.	1/2 Day
<i>Risk Mgmt Planning Workshop</i>	Suitable for Project Managers , participants will learn how to analyze the risks facing a Project. Coverage includes risk identification, prioritization, mitigation, planning, and tradeoffs necessary to minimize the negative effects of unexpected events.	1 Day



<i>Introduction to Microsoft Project</i>	Suitable for Project Managers , participants will learn to encode the tasks, dependencies, resources, and durations into a comprehensive schedule. Coverage includes demonstrations of plan definition and maintenance, capturing “actuals”, report generation, critical path identification, and how to assess the impact of changes.	2 Days
<i>Requirements Review Workshop</i>	Suitable for Systems Analysts and Quality Assurance staff, participants will learn how to plan and conduct an effective Requirements review. An overview of Use-Case Analysis, scenario walkthroughs, meeting facilitation, and achieving closure is included.	1 Day
<i>Planning and Managing Software System Transition</i>	Suitable for Project Managers and Developers , participants will learn how to plan the process by which a software system is transferred between parties or environments. Describes the challenges and techniques used to deploy systems into production, and transfer a system to maintenance.	1 Day
<i>Project Review Workshop</i>	Suitable for Project Managers , participants will plan and conduct a Project Review. Coverage includes meeting facilitation, information collection techniques and tools, and how to analyze and publish results.	½ Day
<i>Relevant Technical Topics</i>	A large selection of technical topics is available for Software Developers . See our Course Catalog at: www.fisher-assoc.com	
<i>Facilitating Productive Meetings</i>	Suitable for the entire Project Team , this course prepares participants to plan and conduct meetings that are a productive use of time for all attendees.	½ Day
<i>Time Management</i>	Suitable for the entire Project Team , this course presents tools and techniques used to maximize personal and professional productivity.	½ Day
<i>Presentation Skills</i>	Suitable for the entire Project Team , this course presents the “do’s and don’ts” of delivering effective presentations. Individually analyzes individual’s current capabilities and provides constructive feedback for improvement. Includes an overview of Microsoft Powerpoint and tips for integrating live software demonstrations.	1 Day
<i>Language Skills</i>	Suitable for the entire Project Team , this course seeks to improve conversational and written proficiency in a Target Language, with an emphasis on technical terminology.	

* *Minimum Duration means that while the class can be lengthened to include additional topics, an Integrated Case Study (ICS), or real Project work, it should not be shortened.*



Appendix C: References and Bibliography

“Expanding International Supply Chains: The Role of Emerging Economies in Providing IT and Business Process Services—Case Studies of China, the Czech Republic, India, and the Philippines”, Michael Engman, OECD Trade Policy Working Paper No. 52. <http://www.wdi.umich.edu/Resources/3171/> last referenced 10/08/07.

The Rational Unified Process Made Easy, Kroll and Kruchten, Addison Wesley, ISBN: 978-0321166098

“A Guide to the Project management Body of Knowledge”, Third Edition, Project Management Institute, ISBN: 978-1930699458

Code Complete, 2nd Edition, Steve McConnell, ISBN: 978-0735619678