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SUCCESSFUL OUTSOURCING WITH THE CRAWL-WALK-RUN STRATEGY

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Uttiya Dasgupta is the Founder and President of the consulting firm, OMNISPAN LLC. Omnispan teams up with software organizations to address their business and technology challenges by leveraging offshore outsourcing. Uttiya has more than 20 years of industry experience as technologist, manager and executive. Prior to founding Omnispan, Uttiya was the Director of Software Development at IDEaS Inc. a Minnesota based ISV, from 1997 to 2004, where he managed a global team of software and QA engineers, delivering revenue management products for the hospitality industry. As part of this role, Uttiya coordinated the setup of an IDEaS India, subsidiary and built offshore awareness and offshore management capabilities in the parent company. Before migrating to the US in 1997, Uttiya worked in Bangalore, India for 12 years. He started as a software engineer with Texas Instruments Inc in 1985, which was the pioneer in establishing an offshore software operation in India . Uttiya joined IBM Global Services, India in 1992 as a Project Manager, responsible for managing offshore projects. In this role, he managed one of the first offshore dedicated centers set up in India, for a foreign client. Following IBM, Uttiya joined Samsung Electronics India as the General Manager of their software operations in 1996 where he was developed a network of Indian offshore companies for providing services to Samsung, Korea. Uttiya has Bachelor degrees in Physics and Computer Science from India. He has been in the trenches of both client and provider ends of offshore outsourcing.



Successful Outsourcing with the Crawl Walk Run Strategy

A Plan for Small to Medium Size (SME)
Software Organizations, Pursuing Offshore
Outsourcing

Uttiya Dasgupta
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6/29/2006

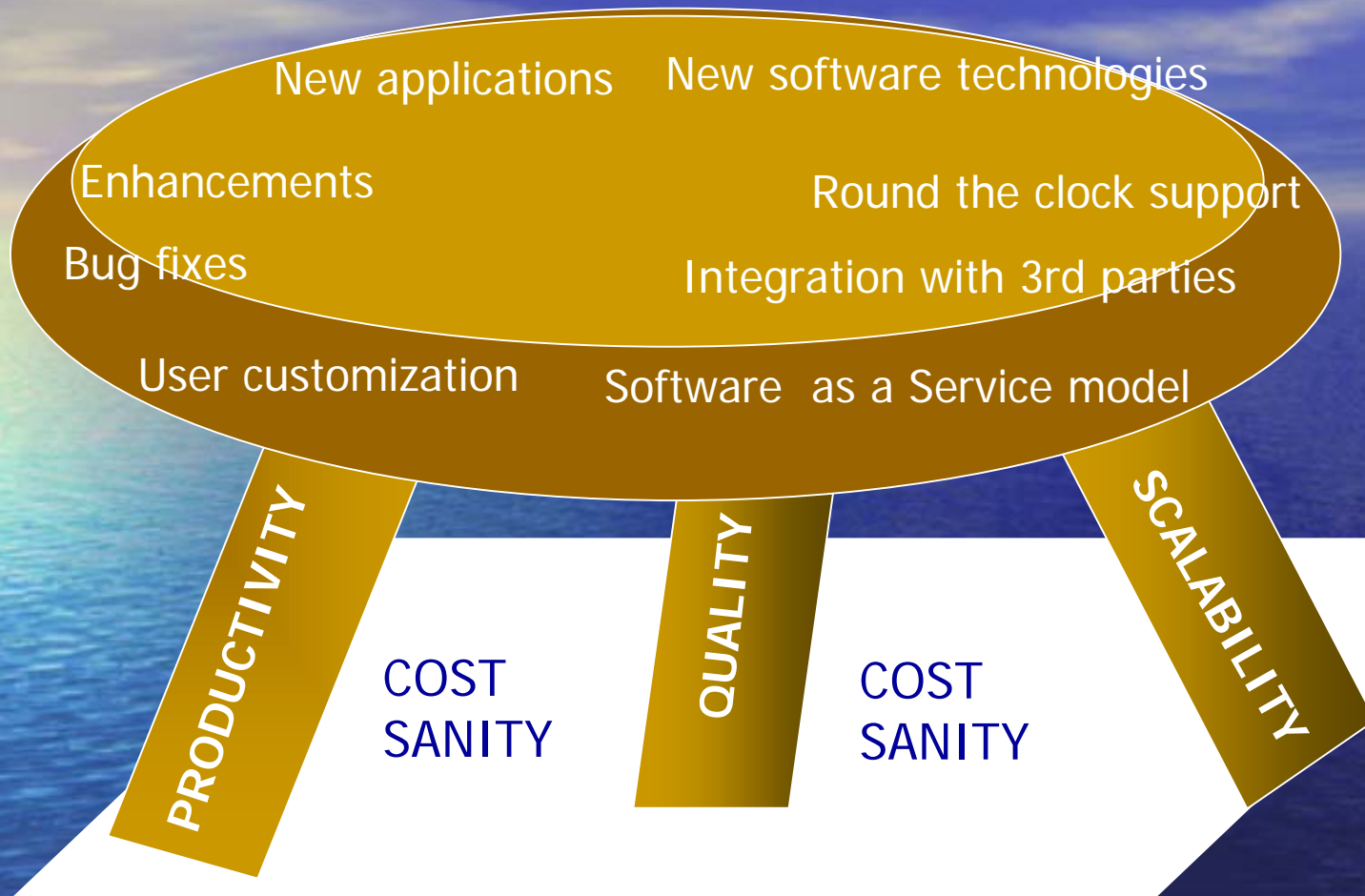
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Agenda

- Why Crawl, Walk, Run ?
 - Grow internal capabilities (“muscles”) for offshore outsourcing
- Explanation of Crawl Phase
- Explanation of Walk Phase
- Explanation of Run Phase
- Summary and Conclusions



Challenges for Software Organizations

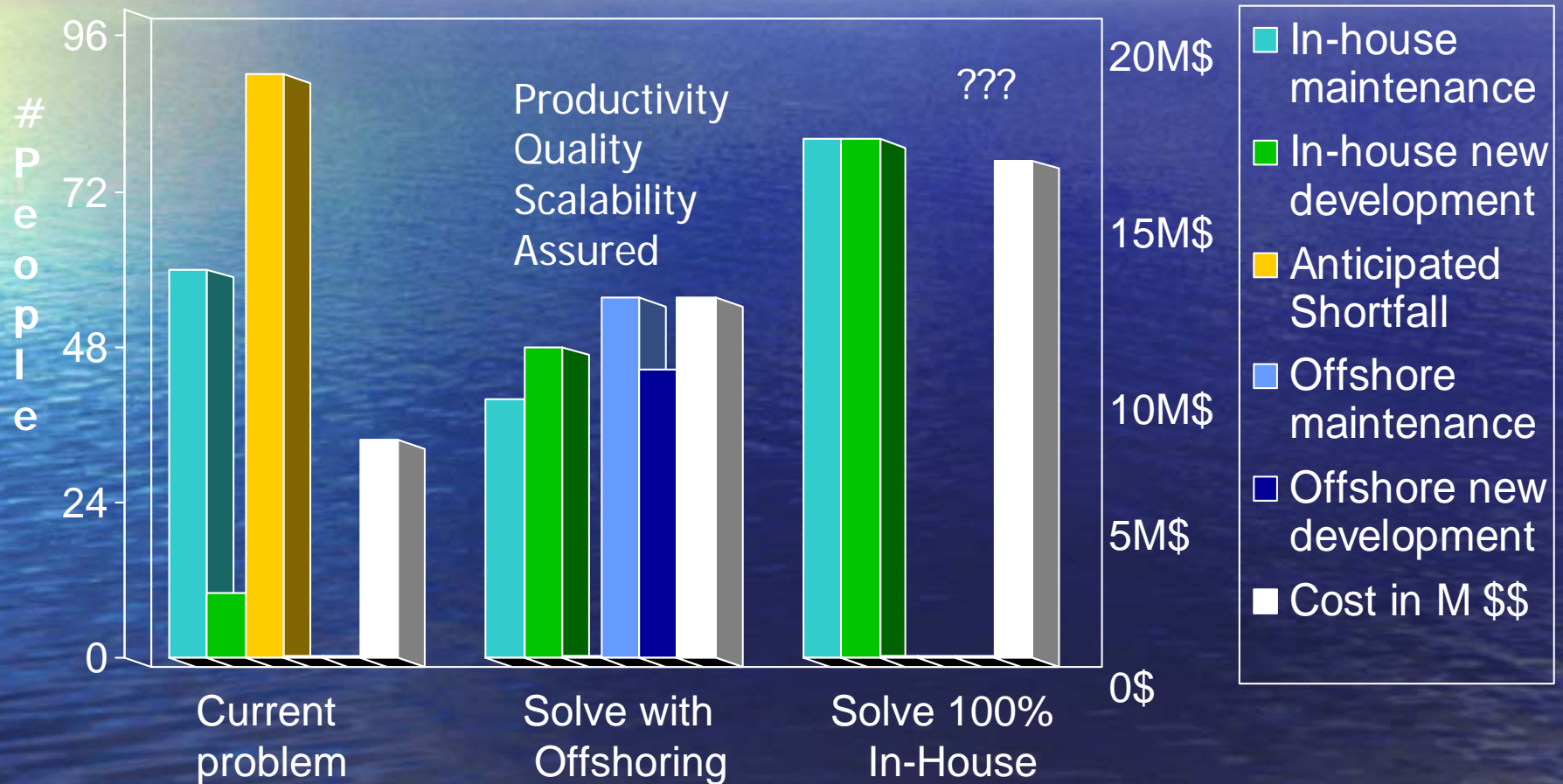


- Environment**
- Open source
 - Outsourcing
 - Data Security
 - Data Privacy & Confidentiality
 - Job Market

Emergence of offshore outsourcing to meet some challenges
 Infrastructure, collaboration, technology and provider capability vastly improved since 90's

Representation of a Vision

- Decision on Offshore Outsourcing Route
 - Executive Sponsorship; Internal Staff Accountabilities



Offshore Outsourcing Agenda

- Distribute Development & Test of Products/Applications
- Distribute Software Engineering Processes
- Involve In-house (Internal) People as Outsourcing Leaders
- Govern/Manage Offshore Operation
 - Type of Operation: Turnkey, Dedicated Staff-ODC, Self Owned
 - Virtual Team : Differs in Cultures, Capabilities, Time Zones ..
- Internal Preparation and Governance : Key Capabilities
 - Offshore Outsourcing: Internal Preparation, Not Labor Rate, Is Key To Savings And Success (Forrester, 2004)
 - Well-defined governance structures and proactive management and communication: keys to success (Diamond Cluster, 2005)

Uncertainties in SME's Capabilities

Are We Prepared?

Internal Resources?

Intrusion in Business

Customer Satisfaction? Time
Effort? Cost? Security?

Can We Govern?

Internal Resources?

Products/Apps

Modularized? Documented?

Culture Differences

Mind-Sets? Behaviors?

Processes

Hand-Offs? Informal?

**Offshore
Outsourcing**

Capability Differences

Business Domain? Technical?

People (All Levels)

Ownership? Role Changes?

Time Zone Differences

Interfaces? Work Timings?

Offshore Partners/Models

Selection? Type of Contract?

Roadmap: Build and Test

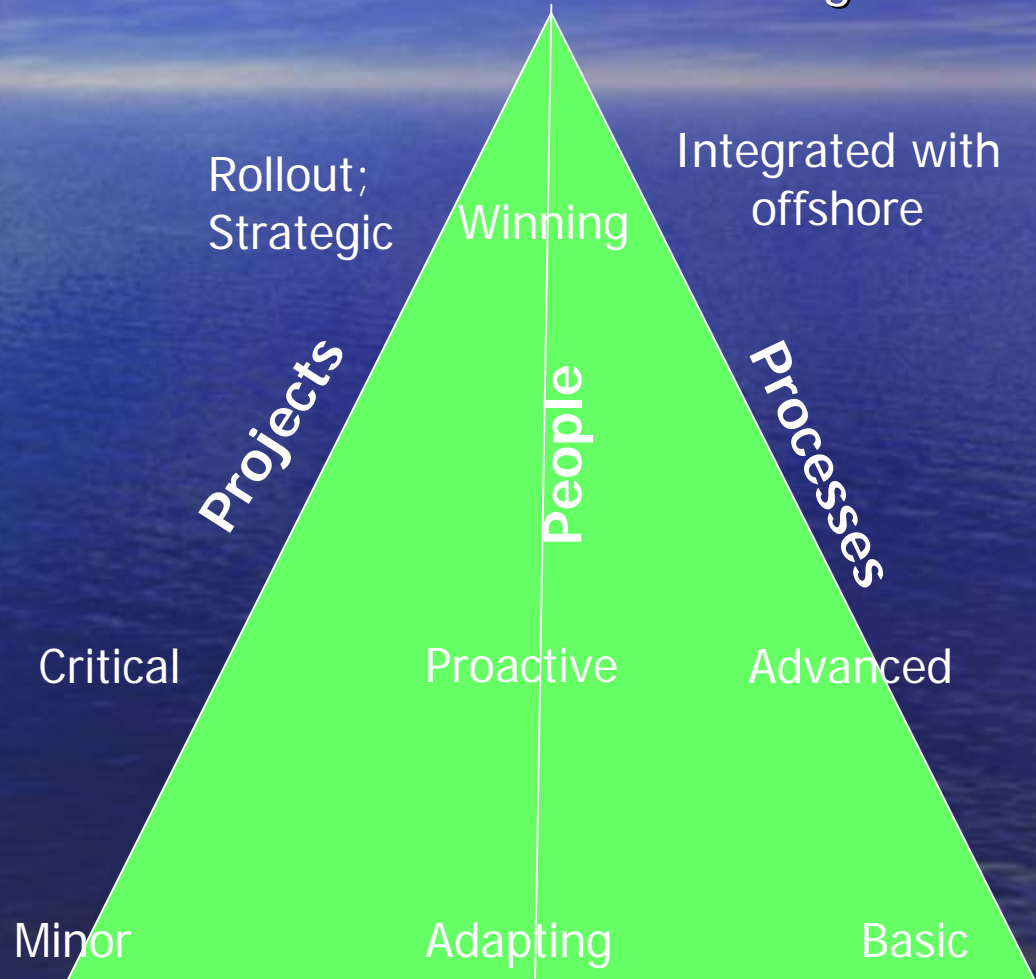
Customer perspective on products/services

Major enhancements.
Alignment with needs.

Noticeable enhancements
Ascending value chain.

Small enhancements

Growing capability for offshore outsourcing





Advantages over Big-Bang Approach

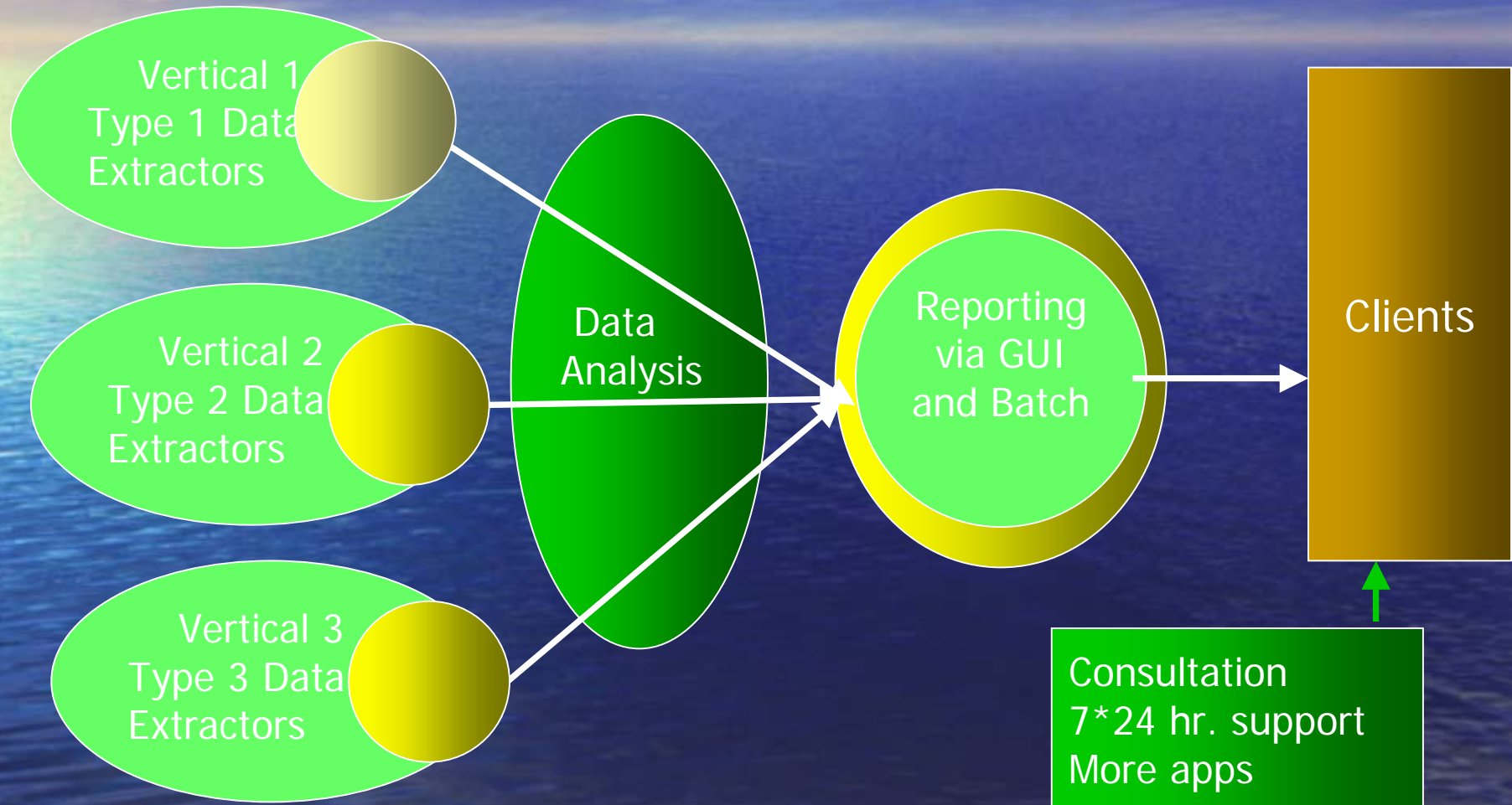
- Leveraging Prior Experience; Downstream Efficiencies
- Better Risk Management; Quick, Inexpensive Recovery
- Limited Intrusion in Existing Work; Ability for Integration
- Focus on Internal Capability; Inside-Out, Controllable
- Control on Cost; Upfront, Incremental, Nothing "hidden"
- Visible Roadmap with Milestones and Deliverables

Suitable choice for SMEs

SME Case Study : 1

Enhance production of reports and value added services

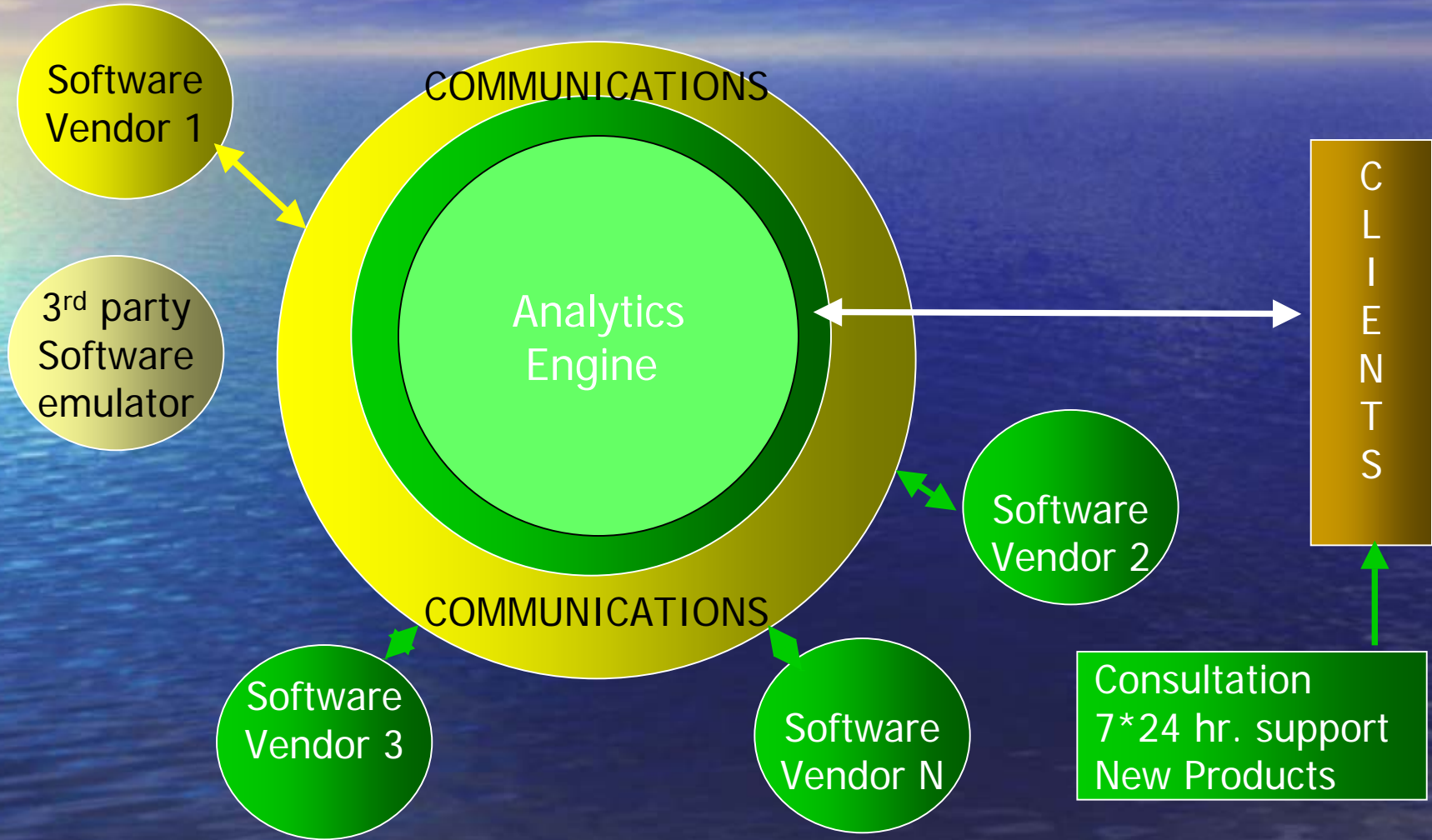
Phase I Phase II Phase III



SME Case Study: 2

Increase market share through more integration with third parties

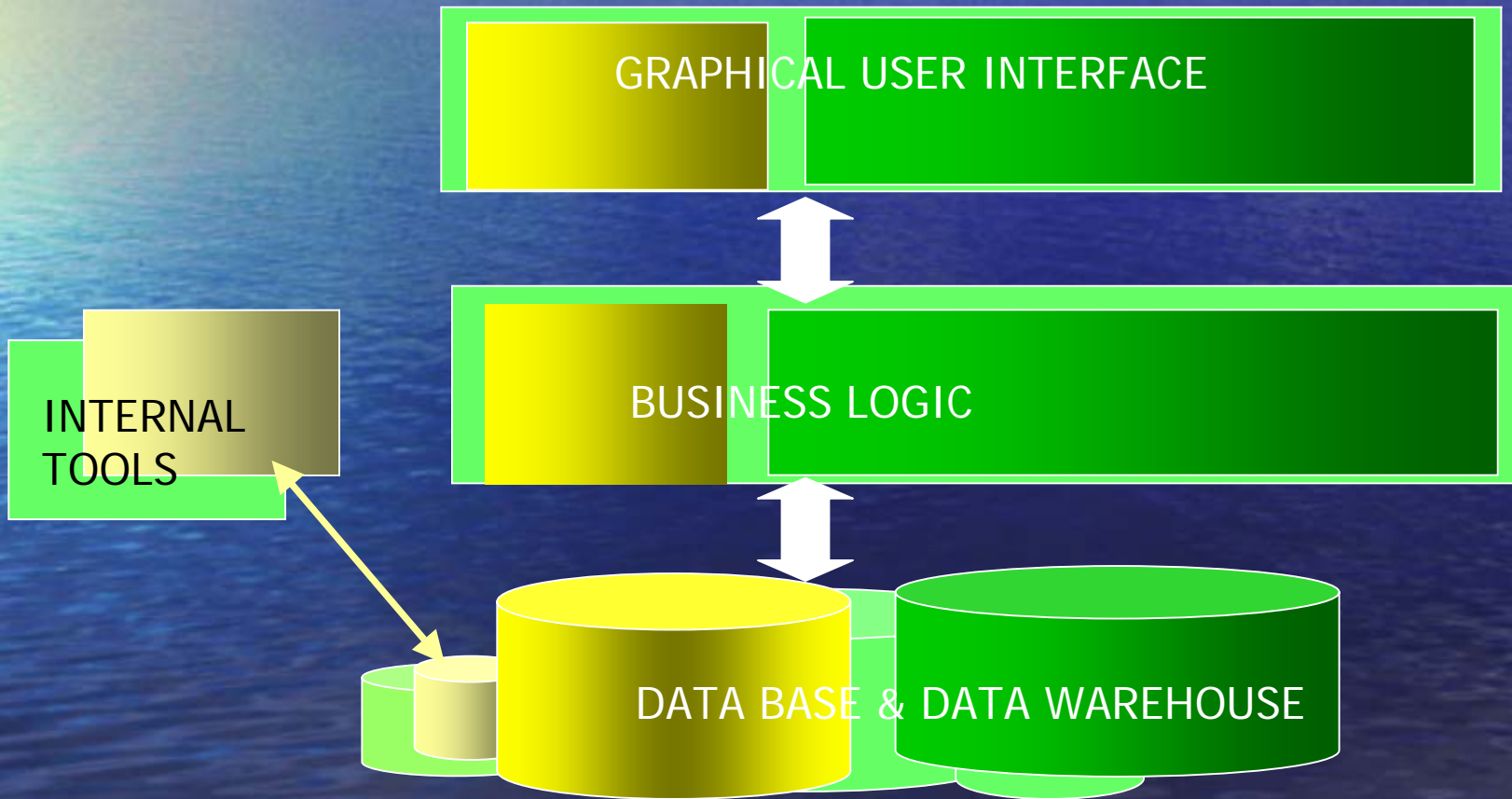
Phase I Phase II Phase III



SME Case Study: 3

Enhance quality, volume of enhancements and maintenance

Phase I Phase II Phase III



SME Case Study: 4

Develop new product at reduced cost



Phase I

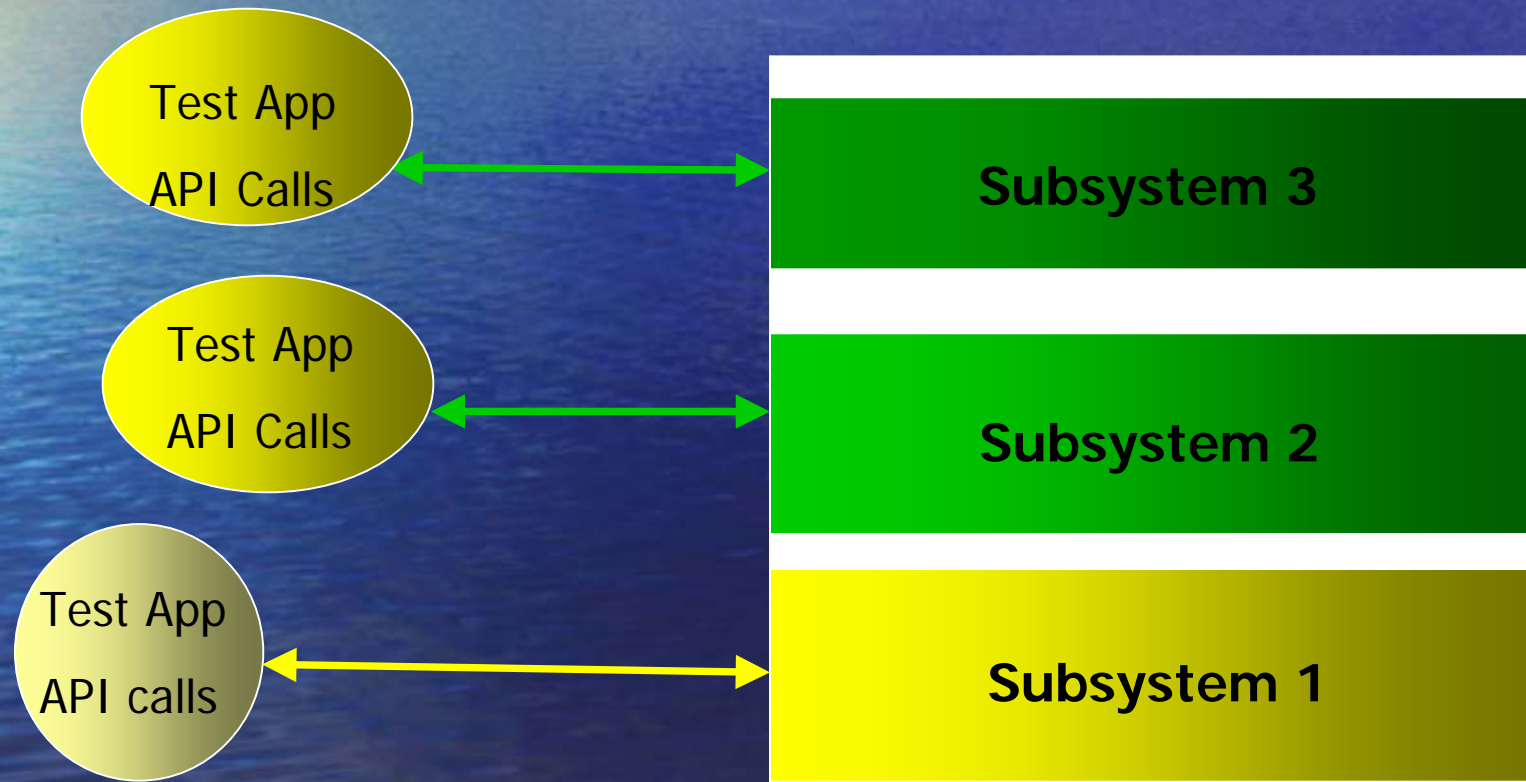


Phase II



Phase III

New Product



Evolution of Offshore Outsourcing

Grow Offshore outsourcing capability in three phases
Crawl, Walk, Run

Attributes	Phase I: Crawl	Phase II: Walk	Phase III: Run
Capabilities	Basic	Maturing	Institutional
Projects	Non Critical	Critical	Critical; Strategic
Contract+	Turnkey, ODC	ODC	ODC, Self owned
Operations	Launch	Control	Seamless; Integrated
Extent	1-2 projects	Major Projects	Rollout in many areas
Interactions	Transactional	Some Tacit	Tacit
People	Responsive	Proactive	Winning

Big-Bang approach attempts to Run at the beginning!!!!!!

+ Choose contract model to suit needs. ODC = Offshore Dedicated Center

Bridge In-house, Offshore Differences

Entity	Perspectives Brought In	Capability Enhancements
Client (You)	<ul style="list-style-type: none"> • Market and Technology • Less 'Operations' Focus • Informal Discussions • Loss of Control Concern 	<ul style="list-style-type: none"> • 'Operations' Perspective • Offshore Awareness • Offshore Governance
Offshore Entity	<ul style="list-style-type: none"> • Technology and Operations • Limited Market Knowledge • Formal Collaborations • Domain Knowledge Concern 	<ul style="list-style-type: none"> • 'Market' Perspective • Business->Technology Map • Excellence in Execution

- Differences more severe due to culture, communication gaps
- Align Perspectives in Phases
 - Start: Common Understanding of Technologies
 - Proof: Proactive Actions to prevent "Lost in Translation"

Introducing Crawl

- Develop Basic Capabilities for Offshore Outsourcing
- Offshore Pilot
- Focus: What to Offshore, What Not to Offshore
 - Modularized, measurable work can be sent offshore
 - Critical, customer sensitive work should not be sent offshore
- Goal: Rapid Learning; Fast Execution
- Business Impact of Failure : Low
- Typically few (1-3) In-house Staff Involved

Projects: Example

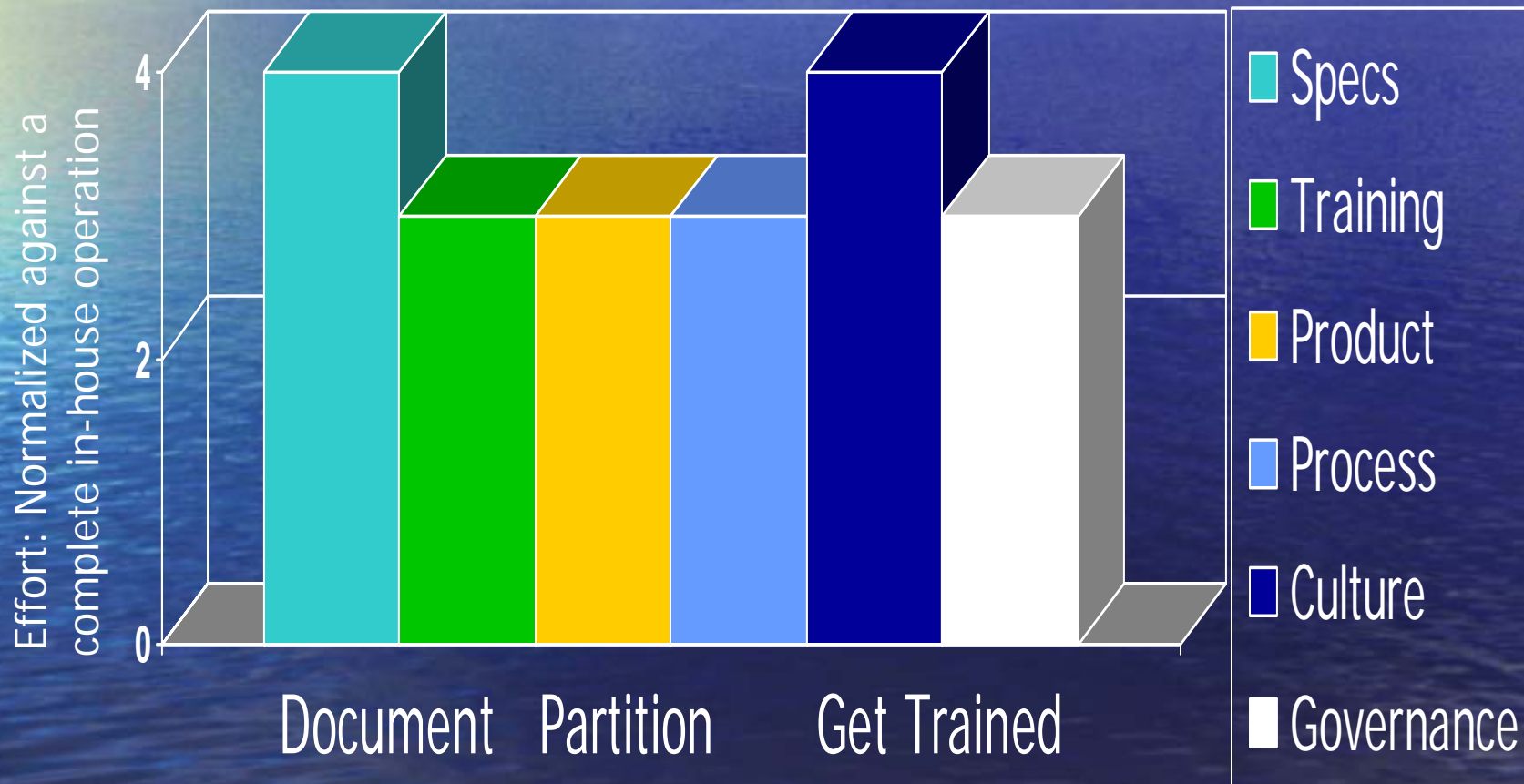
- Typically 3-6 offshore people for 2-6 months

Typical Projects	Limited Demands
Development for internal use: Application audit, support & maintenance tools, test automation tools, documentation Development of "not at risk" modules for market	Business Logic Architecture Technology
Module test design, test execution	Domain Knowledge
Maintenance for less critical bugs and modules	Release Cycles
Porting non critical apps to new platforms	Technology
New app prototyping by onshore presence	Few market needs
Level 2 support for non urgent issues	Few client issues
Existing process capabilities with improvements for hand-offs	Basic collaborative processes, tools

Inputs: Internal Preparations

- Build Basic "Offshore Awareness" Capabilities
 - Involves Effort, Time, Cost

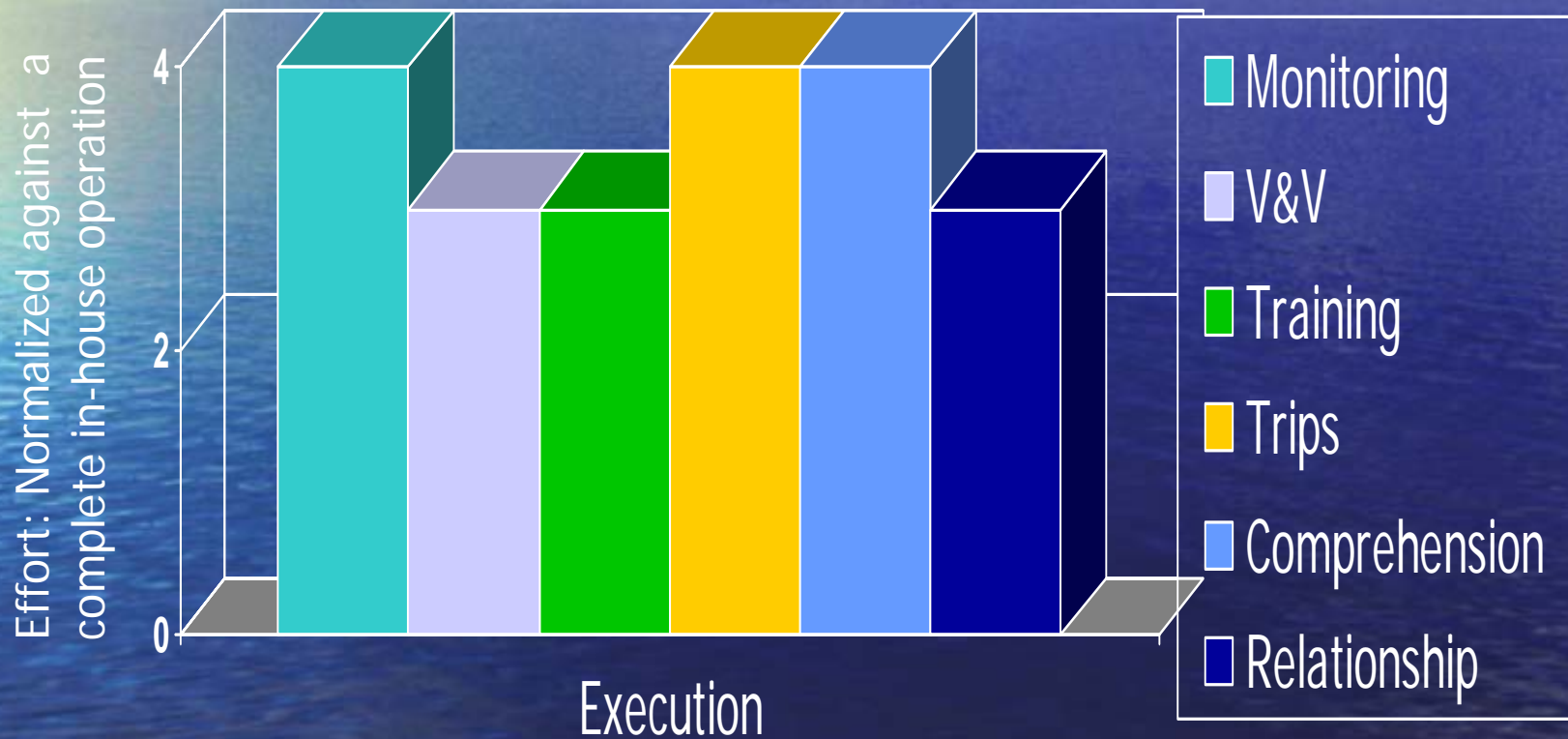
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Inputs: Governance

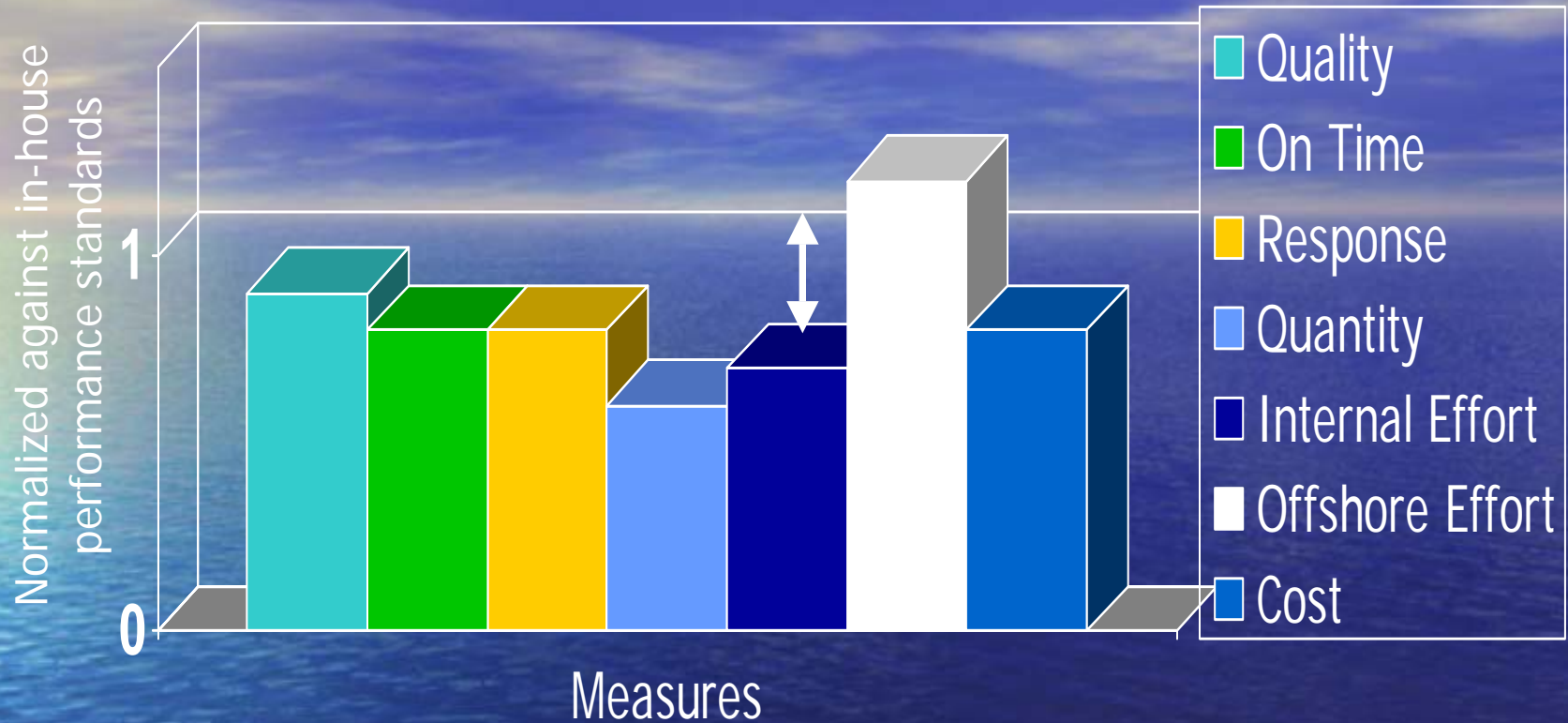
- Build Basic "Offshore Governance" Capabilities
 - Involves Effort, Time, Cost

Numbers: Representative



Options: Presence of offshore personnel in-house or vice versa

Representation of Outputs



- Define attributes for Quality, On Time, Response, Quantity
 - Results below par: First Check Inputs with help from Offshore
 - Internal Effort normalized against effort for full in-house execution
 - Cost : Offshore Effort+ Internal Effort+ Other Setup Cost
- ◆ In-house effort freed up for work on value-added tasks

Case Studies: Lessons Learned

- Success required Preparations and Governance
 - Key capabilities launched during this phase
- Specification changes triggered from offshore
- In-house playing catch-up to offshore production
- Some inappropriate judgment by offshore team
- Improvement in in-house engineering processes
- Major impact of face-to-face discussions
 - Project launch and final approval
- Adaptation slow to start, increased with deliverables
 - In-house leadership became more responsive

Introducing Walk

- Grow Capabilities for Offshore Outsourcing
- Commitment to Offshore Outsourcing, established
 - On Mutual Agreement with Offshore Entities after Crawl
- Scope of Offshore Outsourcing
 - More Crawl type of projects
 - Additional: Modularized, measurable, business critical work
 - Out of Scope: Customer facing work, sensitive/strategic work
- Develop Global Mind-Set and Establish Ownership, Offshore
- More involvement of in-house staff
- Business Impact of Failure : Medium
- Goal: Operational Control; Fast Execution

Projects: Example

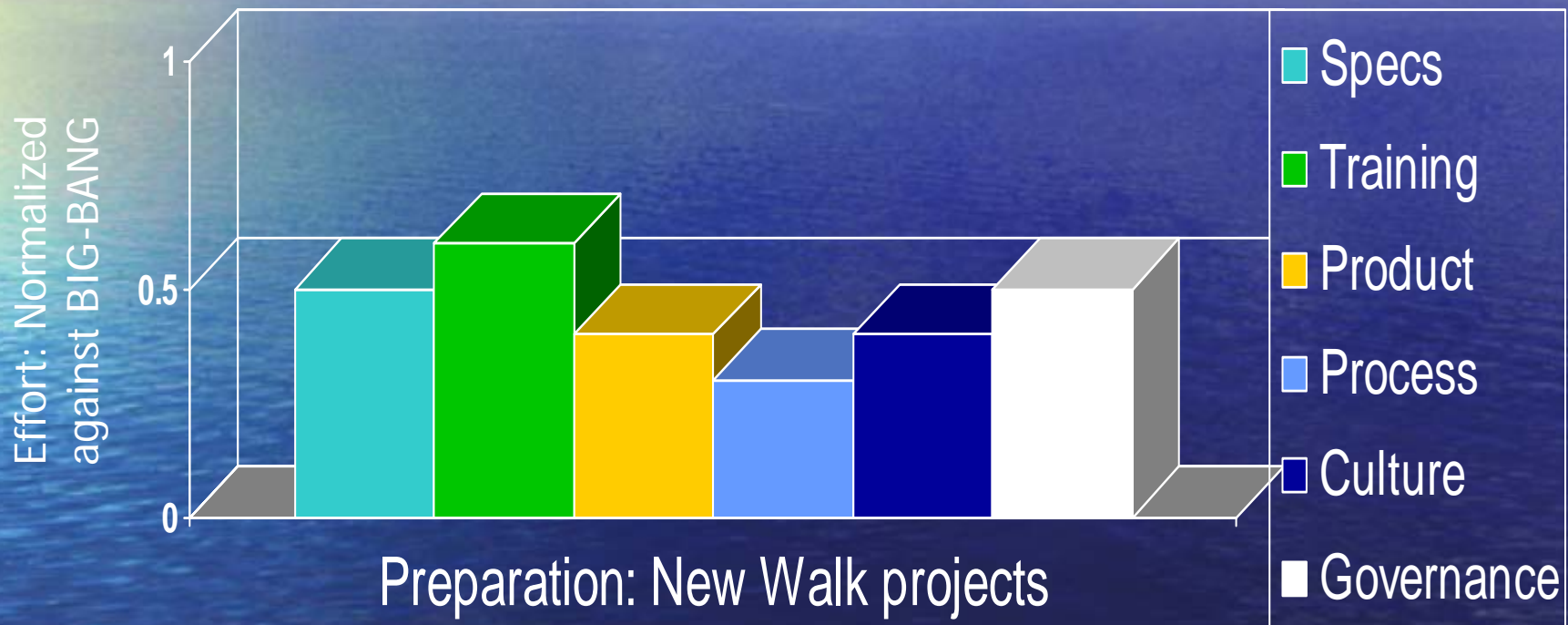
- Typically 4-10 offshore people for 6-12 months

Projects	Increasing Demands
More Crawl type projects	Commoditization
Development for market : <ul style="list-style-type: none"> • Complex modules end-to-end • Reengineer application with open source 	Business Logic, Architecture, Technology
Some System Test Design, Test Execution	Domain knowledge
Maintenance of Some Critical Applications	Release Cycles
Taking advantage of time zone differences	Rapid Test Cycles
Porting Some Critical Apps to New platforms	Technology
Parts of New application development after prototyping completion on-shore	Understanding of Market Needs
Level 2 support for some critical issues	Client Issues
Improved engineering, governance processes	Better Collaboration, Tools

Inputs: Internal Preparations

- Utilization of Domain Knowledge of "Offshore Outsourcing"
 - Growth of Preparations Capabilities (more "Offshore Awareness")

Numbers: Representative

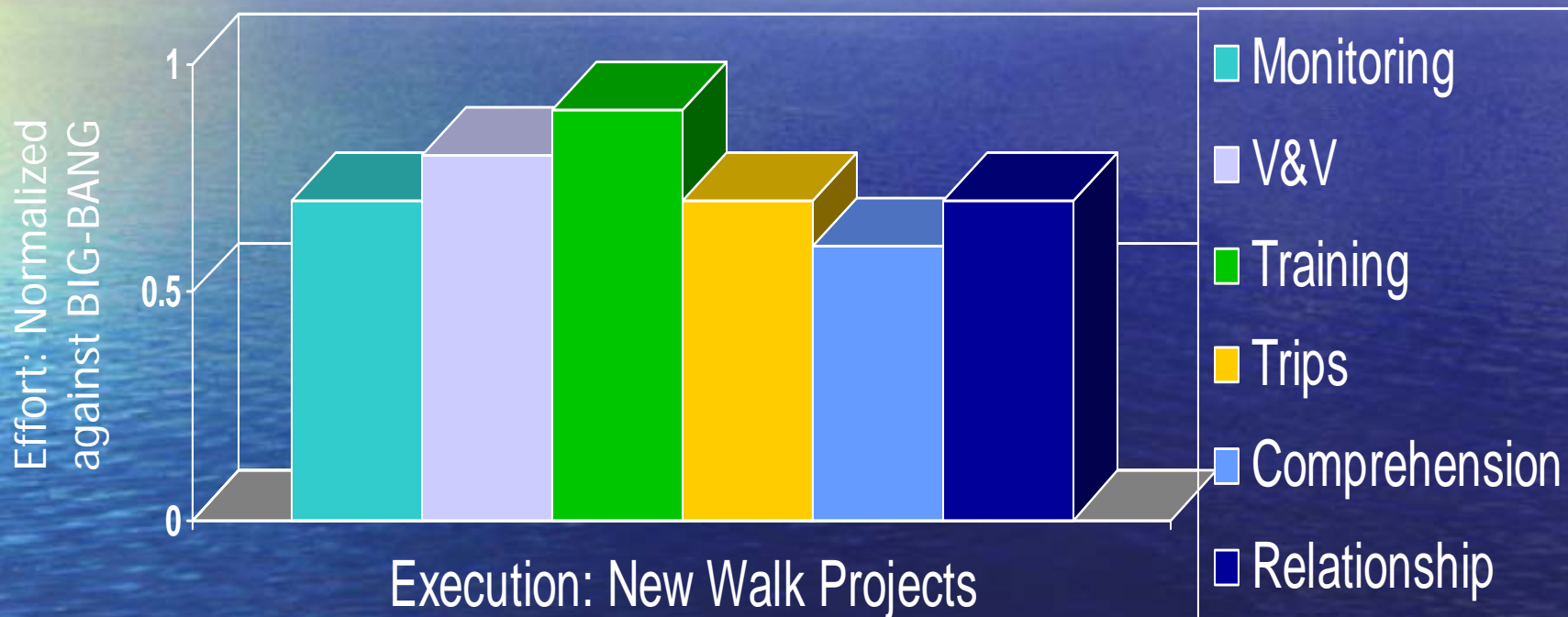


Preparations for Crawl type projects will consume less effort, time
 Offshore people working in-house or vice versa, can aid in Preparations
 Big-Bang could also lead to major rework and "hidden" costs

Inputs: Governance

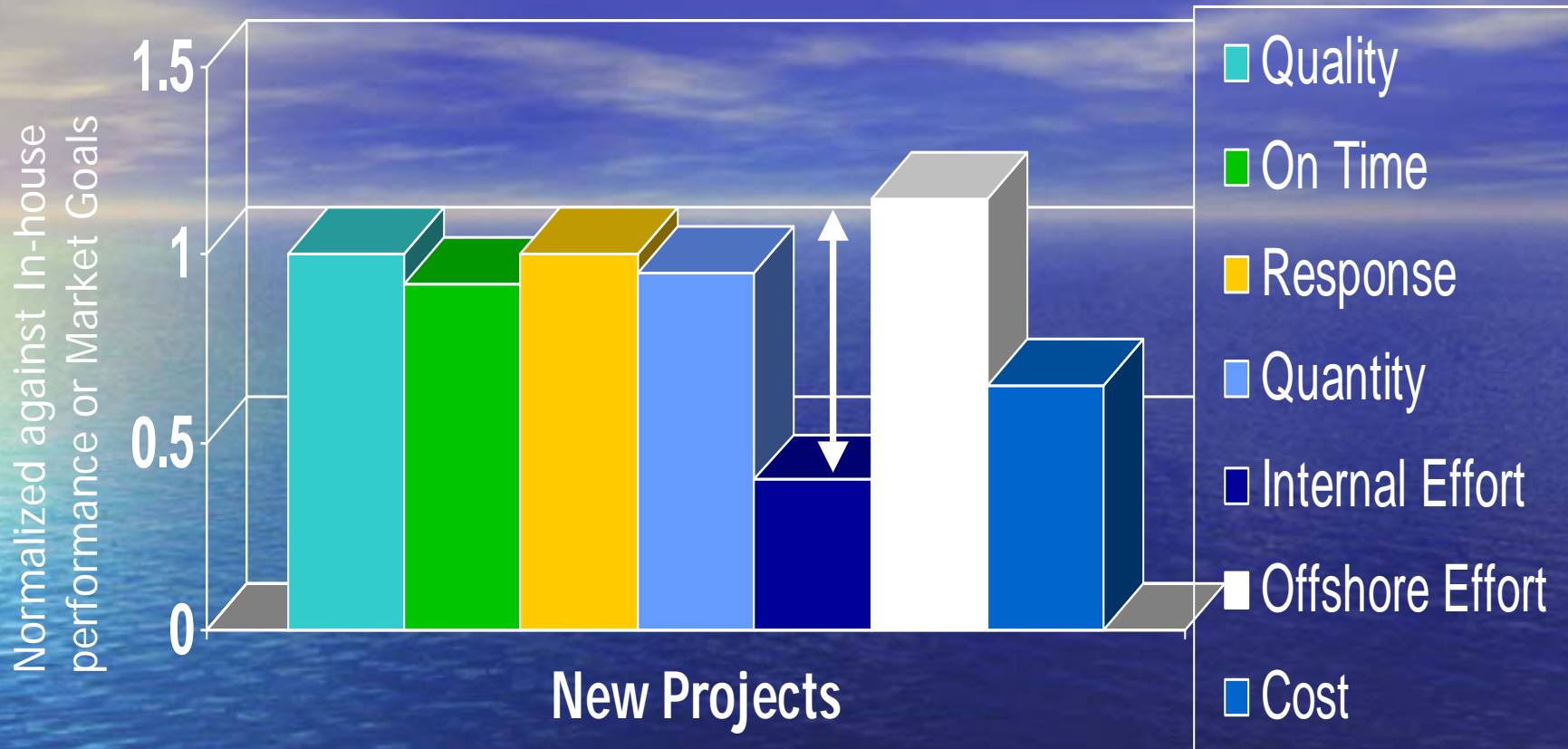
- Utilization of Domain Knowledge of "Offshore Outsourcing"
 - Growth of Governance Capabilities ("better Offshore Execution")

Numbers: Representative



Governance for Crawl type projects will consume less effort, time
 Offshore people working in-house or vice versa, can aid in Governance
 Big Bang could also lead to major rework and "hidden" cost

Representation of Outputs



- Results below par: First Check Inputs with help from Offshore
- Cost : Offshore Effort+ Internal Effort+ Other setup costs
- Improvement in Results for Crawl type projects
- ◄ In-house effort freed up for value-added tasks. Significantly higher than Crawl Phase

Case Studies: Lessons Learned

- Some offshore over-commitment, over-engineering
 - Judgment, prioritization of work requires more effort
- Some changes in specifications
 - Getting offshore staff in-house for spec writing helps
- Offshore ownership of complete modules helps
- Governance effort significant but more manageable
 - Anticipation of needs of offshore entities led to success
- In-house team members in 'execution mode' offshore and vice versa, helps
 - Builds common perspective
- Event celebrations, quiz contests help team building

Failures and Turn-Around

- Crawl, Walk, Run approach prevents failures due to Inadequate Preparations and Weak Governance
- When Failures Occur (typically transition to Walk)
 - Typically Perception Differences (Lack of Team Work)
 - In-house focus on poor output quality and schedules
 - Offshore focus on poor specs and lack of training
 - Each side unaware of paradigms prevailing on other side
 - Build common perspective with mutual commitments
 - Visits from either end to gain business, operational insights
 - Re-work under tighter preparations and governance
 - Defined time lines and deliverables, team work across shores
 - Assess results and decide on next steps

Introducing Run

- Institutionalize Offshore Outsourcing Capabilities
- Roll-Out of Offshore Outsourcing into several work areas
 - Mix of critical and strategic work; 1 or more long term partnerships
 - Mutual agreement with Offshore Entities after Walk
- Scope of offshore outsourcing
 - More “Walk” type of projects
 - Additional: Business critical and business strategic work
 - Out of Scope: Architecture, Customer Facing Critical Work, New Product design/test, Sensitive maintenance and support
- Integration of offshore outsourcing with business

Projects: Example

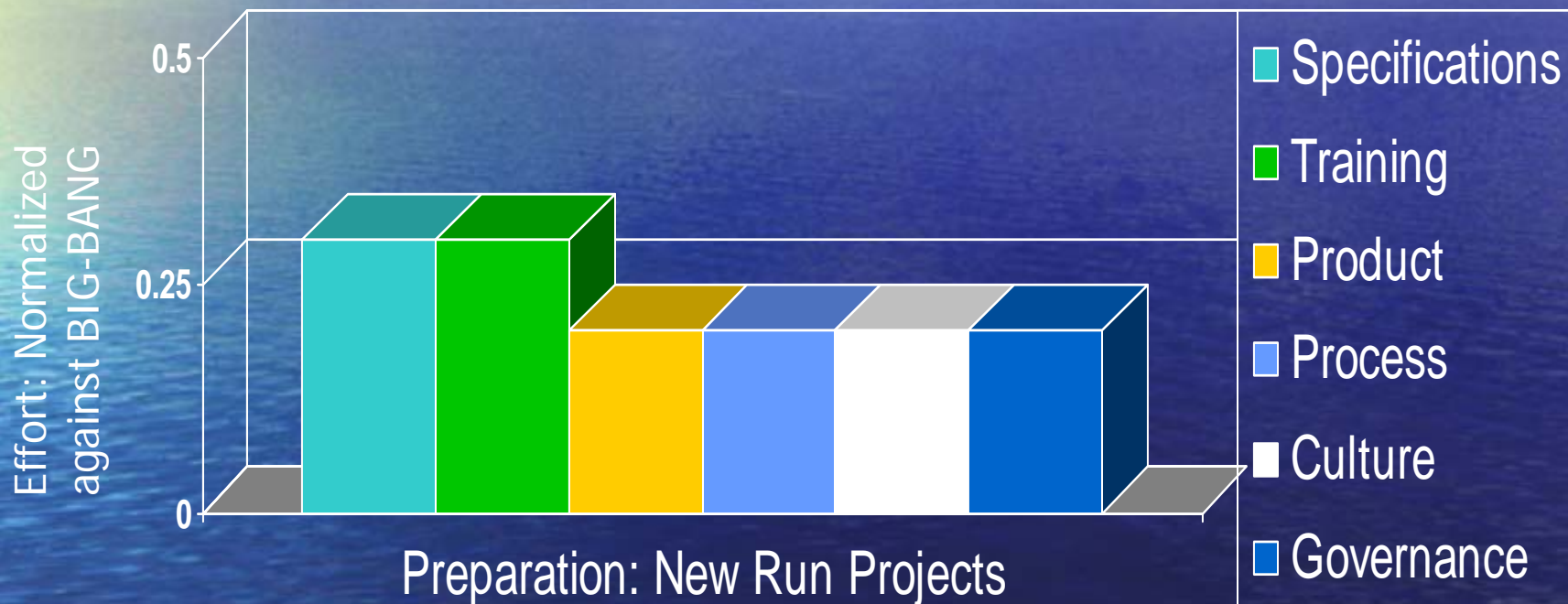
- Typically 10+ offshore people, continuing for several years

Projects	Leverage offshoring
More "Walk" type projects	Commoditization
<ul style="list-style-type: none"> • Complete Responsibility for existing product lines for Maintenance, Enhancements, Tests, Certifications, Customer Support • Active Participation in Product road-map • Development of new products based on design specifications • Research and prototyping of new ideas 	Domain knowledge Technology Market Needs Client Issues
Utilize Integrated engineering and management processes	Optimized Collaboration, tools

Inputs: Internal Preparations

- Institutionalization of Offshore Outsourcing Awareness
 - Best Practices for Internal Preparations

Numbers: Representative

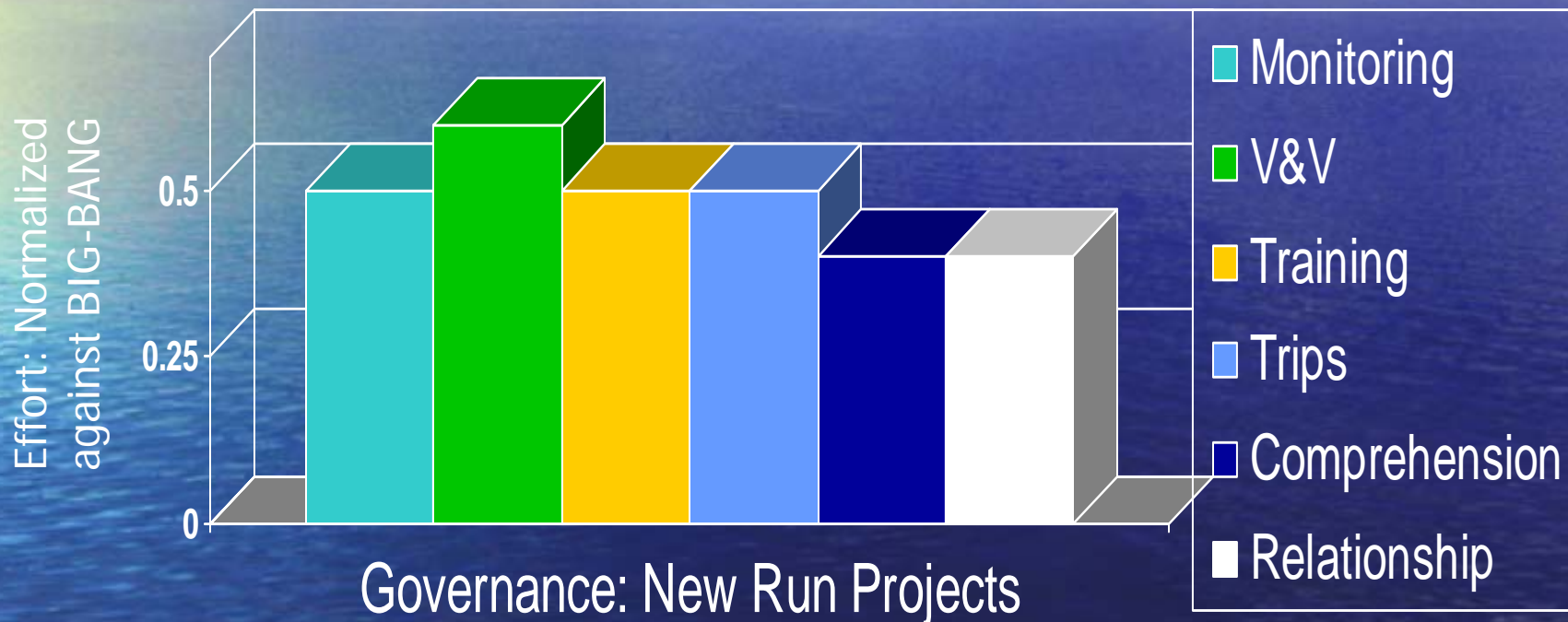


Preparations for Crawl, Walk type projects will consume less effort,
 Offshore people working in-house or vice versa, can aid in Preparations
 Big-Bang could also lead to major rework and "hidden" cost

Inputs: Governance

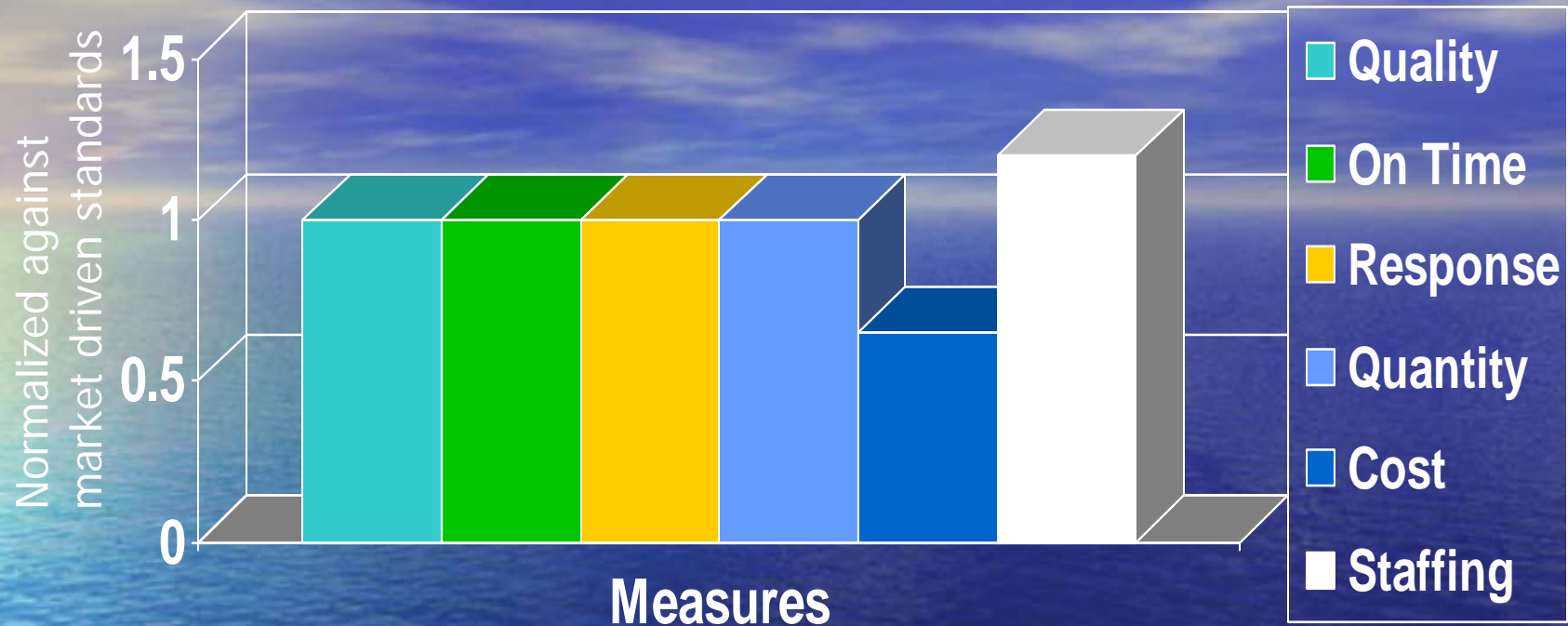
- Institutionalization of Management of Offshore Outsourcing
 - Best Practices for Governance

Numbers: Representative



Execution for Crawl, Walk type projects will consume less effort, time
 Offshore people working in-house or vice versa, can aid in Governance
 Big-Bang could also lead to major rework and "hidden" cost

Representation of Outputs

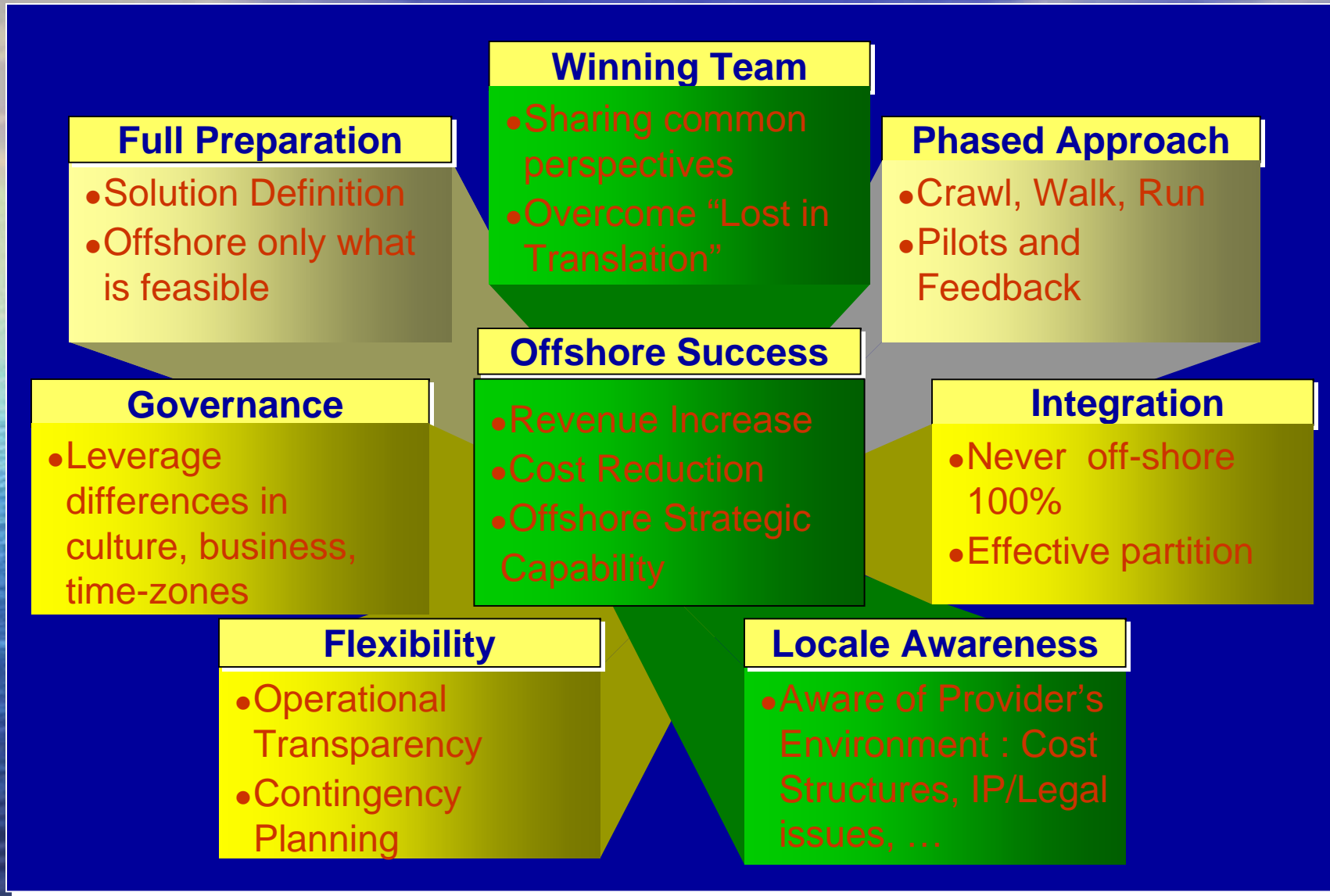


- Results below par: Winning Team to take action
- Continuous raising of performance targets in this phase
- Value added functions bringing in more revenue (not shown)
- Cost and Staffing: Related to offshore work + in-house coordination
- Expected process improvements throughout the company
- Improvement in Results for Crawl and Walk type projects

Case Studies: Lessons Learned

- Proficiency in managing Offshore Operations came with practice, time and commitment : Outcomes successful
- Occasional misjudgment of Offshore capability
 - Business problems due to “running” too slow or too fast
- Peer to peer interactions helped significantly
 - Focus: Technology, Not schedules
- Periodic Planning Cycles to allocate, review work and make course corrections, helps significantly
 - Started in Walk Phase; Links with unfolding business
- Resolution of differences in perspectives requires continuing effort in building one team

Best Practices of Offshore Outsourcing



Conclusions

- SMEs should develop offshore outsourcing in phases
 - Grow capabilities (“muscles”) via a Crawl, Walk, Run
 - Internal Preparations and Governance: Key Capabilities
- SMEs to structure Initial Plan for Crawl, Walk, Run
 - Growth of Projects, Processes and People
 - Driven by Vision of Solution to Business Challenges
- Followed by ...
 - Preparation for Crawl Phase; Offshore Entity Selection
- SMEs to prioritize metrics to highlight fundamentals of Crawl-Walk-Run strategy



QUESTIONS?

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Successful Offshore Outsourcing with the Crawl, Walk, Run Strategy

A Plan for Small to Medium Size Software Organizations Pursuing Offshore Outsourcing

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ABSTRACT

This paper describes a usable and inexpensive process for growing the offshore outsourcing capabilities (“muscles”) of a small to medium size (SME) software organization, in phases. The capabilities are demonstrated by the leveraging of offshore outsourcing to progressively address complex business challenges. An SME can use this document to plan out an offshore outsourcing strategy, instead of trying to follow a Big-bang approach. The process starts by creating a vision of an integrated in-house offshore operation with clearly defined goals. This is a picture of what may be called the Run phase of the operation. However to reach that point, would require a strategy that defines a) specifications of intermediate phases, b) preparations for internal (in-house) Products, Processes and People (PPP) and governance structures and c) execution of appropriate governance of a virtual team that differs in culture, domain knowledge, business environment etc. The first phase of the strategy should be planned as a Pilot or a Crawl phase, in which the SME learns to work with an offshore entity. Here, the risks should be limited to the offshore execution of some non critical projects. Upon success, the SME should gain more muscle and proceed to the Walk phase. Complex offshore projects involving higher risks and more strict performance metrics should be executed in this phase, in addition to the Crawl type of projects. Progress should be marked by proficiency in management of complex offshore projects and progressing towards operational control. Success in the Walk Phase should lead to the final phase which is a Run or the Rollout phase, in which offshore outsourcing becomes a seamless operation and permeates several functional areas of the SME. Offshore projects should now involve strategic content, in addition to the Walk type of projects. The Run phase should also be characterized by the ability of the SME to build a Winning Team with offshore entities, for achieving the original vision. Four case studies of real software operations are also illustrated.

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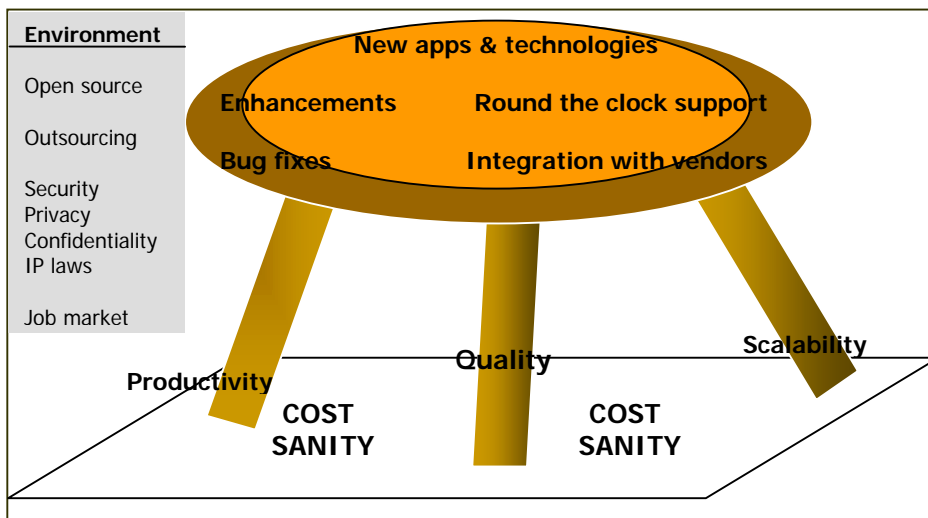
Figure 20: Outputs/Results from "Run" 18

1 Introduction

In this paper, we discuss a strategy for growing the offshore outsourcing capabilities (“muscles”) of a software organization using the Crawl, Walk, Run metaphor. This approach is suitable for a small-to-medium size software organization (SME), seeking to leverage offshore outsourcing to meet major business challenges. In this paper we assume a decision to pursue an offshore route, has been made. We do not define the process for selecting the appropriate offshore partner(s) or get into the details of offshore contract models, specifics of Business Process Outsourcing, or handling of security and privacy issues in offshore outsourcing. Further this approach is for companies that would like to utilize offshore outsourcing for the long term (i.e. as a strategy), as opposed to execution of a few projects.

2 Challenges Faced by Software Organizations

Software organizations the world over, are faced with myriad challenges. The need for continuous support, maintenance and enhancement of applications, has to be balanced by delivering new applications, and utilizing the latest and greatest software technologies. Figure 1 depicts these challenges.



Demands on a software organization are shown in the form of a three legged stool, supported by the three legs of Productivity, Quality and Scalability. The legs need to keep the stool in balance. The floor which keeps the stool standing is Cost Sanity. For spiraling cost, a squeeze on cost or for anomalies in any of the legs, the stool collapses. The company also connects with the environment.

Figure 1: Demands on Software Organizations

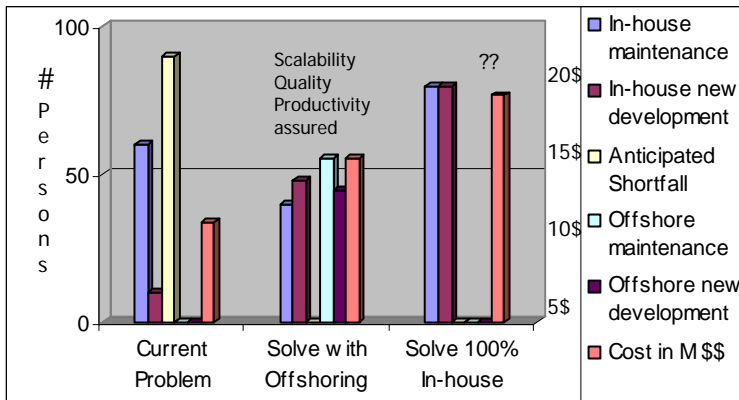
Many SMEs are turning towards **offshore outsourcing as a strategy** to meet these challenges. There have been significant improvements in infrastructure, communication technologies, collaboration tools and offshore provider capabilities since the 90s which makes this an attractive proposition.

3 Leveraging Offshore Outsourcing

The decision to use offshore outsourcing as a strategy is primarily made by the senior executive team of

an SME after a quick feasibility assessment. An executive sponsor is usually identified to spearhead the efforts. It is critical that all in-house team members engaged in leading the offshore initiative are held accountable through setting of performance goals or other appropriate mechanisms.

At the beginning of the initiative, a vision of offshore outsourcing should be created by the executive team, in terms of the business challenges it intends to solve. Fig.2. represents such a vision.



In this representation, the SME estimated a shortfall of 90 persons over the next 18-24 months to meet their growing demands. They looked at an integrated in-house (internal), offshore operation to meet these needs while controlling the overall costs. The mix of work between in-house and offshore appeared feasible. The SME allocated internal cost for management of offshore operations, in addition to in-house and offshore labor costs.

Figure 2: Vision of a Solution

Detailing the work break-down in figure 2, functions sensitive to customers such as business process modeling and associated development of new tools, system architecture, product and service certification, new software requirements, new product design, sensitive support and maintenance, etc. should be the primary responsibilities of the in-house group. The primary responsibilities of the off-shore groups should be system design and development, system test and deployment, normal customer support and maintenance. The teams should also complement each other to discharge their responsibilities, thus ensuring an integrated in-house, offshore operation.

Some companies tend to execute a Big-bang approach to realize the vision, with a primary focus on cost reduction. This involves outsourcing too many functions at too fast a rate. There are major risks in this approach, since the client has not invested in its internal capabilities adequately. The outsourcing provider is also not prepared to deliver against expectations and failures are likely. An SME may face severe business hardships should failures occur, making the Big-bang route less attractive.

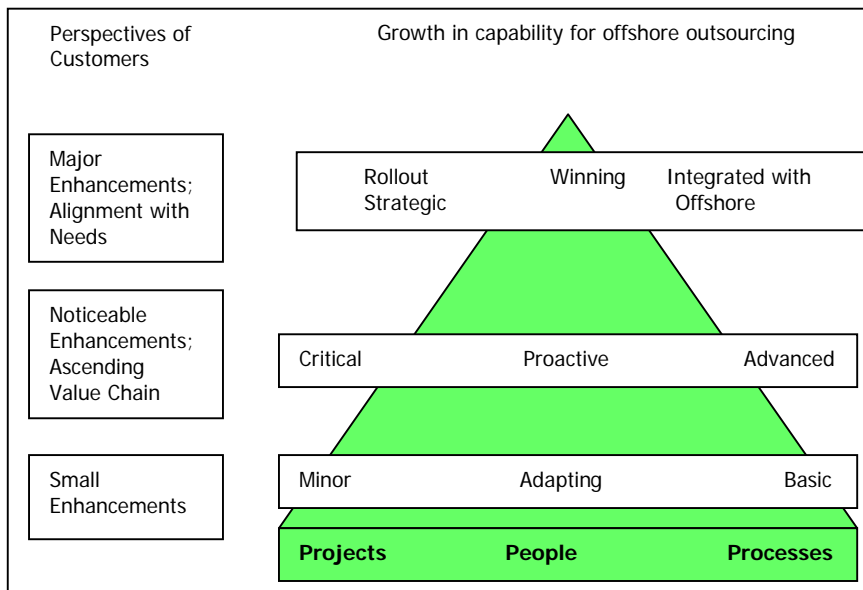
3.1 Progressive Reduction in Risks

Many companies have realized the hard way, that upfront investments in preparations [1] followed by effective governance at run-time, significantly enhance the chances of success in offshore outsourcing. Surveys [2] related to offshore outsourcing also cite the absence of the client’s execution of proper homework, as one of the major failures of offshore outsourcing. A capability to Prepare and a capability to Govern are central to offshore outsourcing, which an SME needs to develop internally, to deliver against the vision. Development of these capabilities involves effort, time and associated cost.

When an SME, starts on the path to offshore outsourcing, it should ask several questions about its existing capabilities. Are its **products** architected suitably such that these could be developed and tested in a distributed fashion? Does it have a **process** discipline for software engineering, and how could it

have a seamless work-flow with the offshore locations? Does it have **people** who have an appetite for risks, and are willing to lead the initiative, which could lead to their acquiring new skills? How would it choose the appropriate offshore entities (providers, self owned subsidiaries etc.) and the contracting model for long term partnerships? How much of an intrusion would offshore outsourcing cause in its existing customer base, and in its current ways of doing things? And finally, how would it communicate effectively with offshore groups, which have significant differences in culture, business and technical capabilities and time zones, which cut right into the heart of **governance**?

When an SME seeks answers to these questions, it is shining a spotlight on existing operations and discovering issues that remain buried in the urgencies of day-to-day business. Typically, an SME has a limited budget and an over demanding market. It does not have the resources to execute elaborate processes, it needs something which is pragmatic, builds its capabilities fast, and reduces the risks of offshore outsourcing. A phased approach of incrementally building and testing offshore operations, through effective internal preparations and exercising of strong governance should enable the SME to meet all these needs. Figure 3 shows a roadmap for enhancing customer satisfaction while increasing offshore outsourcing capability in the three dimensions of Projects, Processes and People.



This phased approach progressively reduces the risks in offshore outsourcing. This approach is better than a Big-bang, since a) it leverages previous phases leading to greater efficiencies downstream, b) it is easier to recover from risks, c) it has better control over expenses, there are no “hidden” costs d) it leads to progressive adoption in the company e) it delivers a visible road-map and f) it creates limited intrusion in daily work, making it easier for integration. This is an inside-out approach that is controllable, giving it an edge.

Figure 3: Incremental Build and Test Strategy

3.2 *Crawl, Walk and Run Phases*

In line with the phased approach in section 3.1, we now formally define the Crawl, Walk and Run phases of growth in offshore outsourcing capabilities. The Crawl Phase is the first phase, where the proof of concept of an offshore operation is developed. With success in the Crawl Phase, an SME grows more muscles in operations, and initiates the Walk or Commitment Phase. When the Walk Phase is successful, the operation reaches the Run or Roll-Out phase, in which offshore outsourcing permeates different functional areas and integration with the business is achieved. This is shown in figure 4. The Big Bang approach in comparison, attempts to Run first before going through the Crawl and Walk phases!!

Attributes	Phase I: Crawl	Phase II: Walk	Phase III: Run
Capability	Basic	Maturing	Institutional
Projects	Non Critical	Critical	Critical; Strategic
Contract+	Turnkey, ODC	ODC	ODC, Self owned
Operations	Launch	Control	Seamless; Integrated
Extent	1-2 projects	Major Projects	Rollout in many areas
Interactions	Transactional	Some Tacit[3]	Tacit[3]
People	Responsive	Proactive	Winning

The somewhat rigid interactions in the Crawl Phase (occasionally dot the I's and cross the T's) are enhanced by an SME's gaining more understanding of offshore interactions in the Walk Phase. In the Run Phase the interactions can get more tacit [3] especially with some long standing offshore entities. In this Phase, each side can deal with ambiguities and exercise high levels of business and operational judgment, making offshore outsourcing more effective. An SME can also plan internal time, effort and cost to progress through these phases.

Figure 4: Crawl, Walk, Run Phases

+ Some types of offshore entities and contracts are shown. An SME should choose a contract model based on its needs and not get sidetracked by the complexity of various models. An ODC (or Offshore Development Center) occurs when an offshore provider dedicates a fixed number of persons of different engineering and management skill levels, to the projects of the SME. This model is suitable for reflecting unfolding business events that lead to changes in specifications. Many companies decide to set up their own offshore subsidiary, although this is less likely to occur in the early phases. For information on offshore contract models, the interested reader can refer to [4].

3.3 Gaining a Common Perspective

At this point, we would like to highlight a major area that tends to get downplayed in most offshore outsourcing initiatives. This is the difference in perspectives between the in-house and offshore groups. Typically the in-house group is focused on its customers and its technology and does not have adequate experience of offshore operations. Their style of communication is typically informal; issues tend to get addressed at times, in the hall-ways and cubicles. Team members learn by “existing” with the business. This environment may not provide them with the skills necessary to coordinate an offshore operation, which requires structured, formal, communications. In contrast the offshore groups typically have strong communication processes and strong technologies however they lack direct exposure to the business and unfolding realities of the market place. This may not provide them with the capability to resolve ambiguities in instructions or to make sound technical decisions. This lack of a common perspective can lead to a “Lost in Translation” syndrome, in which both sides may go through the mechanics of collaboration, without grasping fundamental concepts. As a result a minor unwritten sentence in a software specification supplied to an offshore provider (as perceived by an SME) or a minor request to the SME for changing a feature (as perceived by an offshore provider), may have the potential to cause major problems.

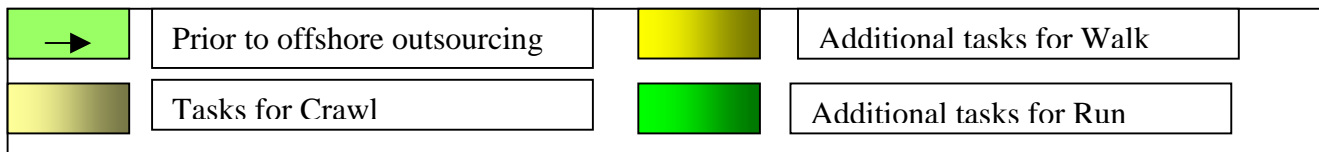
The above is generally true for any outsourcing initiative, but is especially severe for offshore outsourcing where differences in cultures, business understanding, time zones etc. could cause even the best intended

communication effort to go astray. Common understanding of technologies is a bridge to start a process of unifying perspectives, which usually takes time to mature. Creative ways of using collaboration tools to verify and reinforce business and operational concepts should be continuously explored (there has been an explosion of collaboration mechanisms and tools starting with business trips, telephone, e-mail, chat, through to Web based project management, configuration management, design and test, VOIP applications etc.). In the Crawl, Walk, Run approach, an SME would be capable of understanding the paradigms prevailing on the offshore end, in a step by step manner. This is also true of offshore providers. This development enriches collaborations, leading to the emergence of a Winning Team working across the shores.

4 SME Case Studies

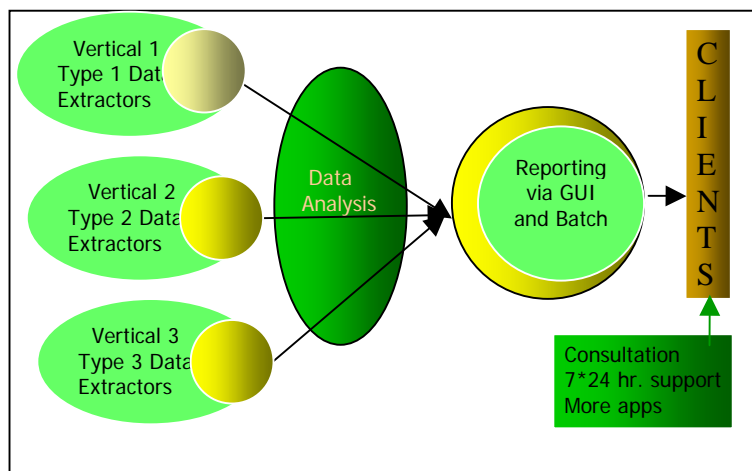
We present four case studies of the Crawl, Walk, Run approach to solve complex business challenges for SMEs by leveraging offshore outsourcing. Each case study involved the building of internal capabilities for offshore outsourcing in phases, leading to major success. The critical importance of investing in Internal Preparations and Governance were realized by every company. Each company also gained cost savings, in comparison to doing things completely in-house.

Each schematic is color coded as follows:



4.1 Case Study 1

The SME was an ISV delivering reports from data extraction applications to three industry verticals for enabling decision support processes. Their vision was to increase the production of data extractors, and increase their market share by developing new applications and offering consultancy services.



Crawl: Wrote data extractors for 1 industry vertical

Walk: Developed data extractors for all 3 industry verticals, and extensions to GUI

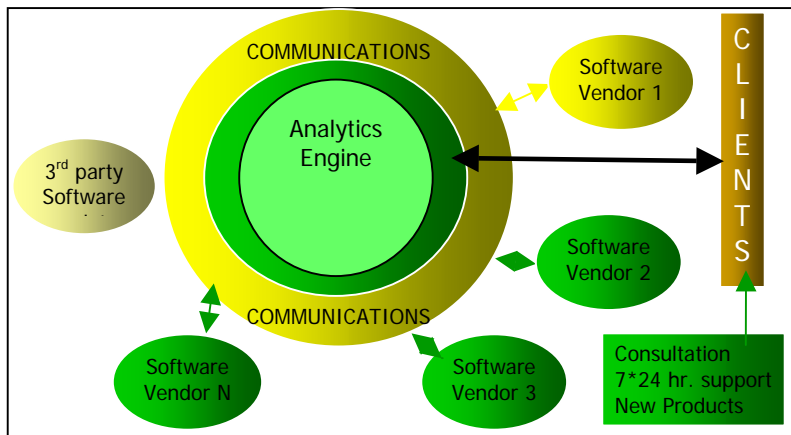
Run: Developed data extractors for all 3 industry verticals + value added data analysis tools, more applications and provided 7*24 hour support to world-wide customers. The in-house team could also deliver added consultancy for decision support processes

Figure 5: Schematic for Case Study # 1

The SME learned that by working on the provider end for a few weeks, its key engineers gained significant insights for improving hand-offs. Software specifications underwent major improvements.

4.2 Case Study 2

The SME was an ISV, which needed to expand the market reach for its product by integrating it with various third party products. This would be enabled by the design and development of a new communications layer. It also planned for further valued added applications and consultancy services.



Crawl: Developed 3rd party software emulator for testing specifications of Communications layer.

Walk: Implemented Communication Layer and integrated with first software vendor

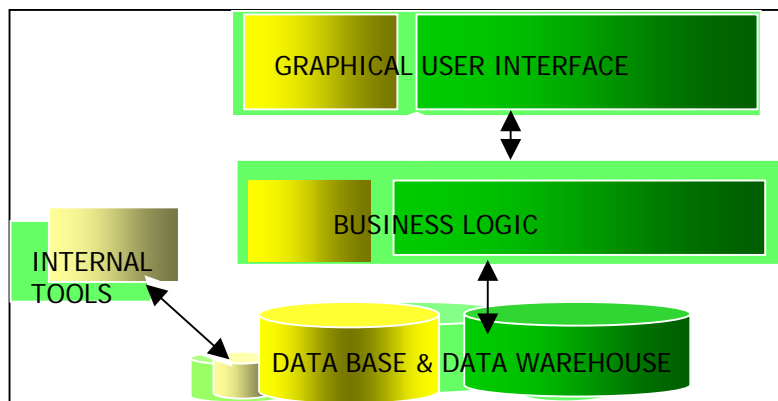
Run: Integrated with several 3rd party vendors. Enhanced Internal Analytics Engine. Developed new applications, provided 7*24 hr. support to world wide customers and provide consultation.

Figure 6: Schematic for Case Study 2

The SME learned that conducting prompt V&V of the deliverables sent from offshore was key to success. It could resolve some over-commitment and over engineering issues related to the offshore effort, by sharing unfolding business realities and driving business solutions as opposed to pure technical solutions.

4.3 Case Study 3

The SME was an ISV that wanted to enhance the quality and quantity of its deliverables to the market.



Crawl: Developed internal tools (app audit & support) not used by customers.

Walk: Developed and maintained few end-to-end modules some were critical and some were non critical

Run: Maintenance and development expanded to several end-to-end modules of the application with complete ownership of the GUI.

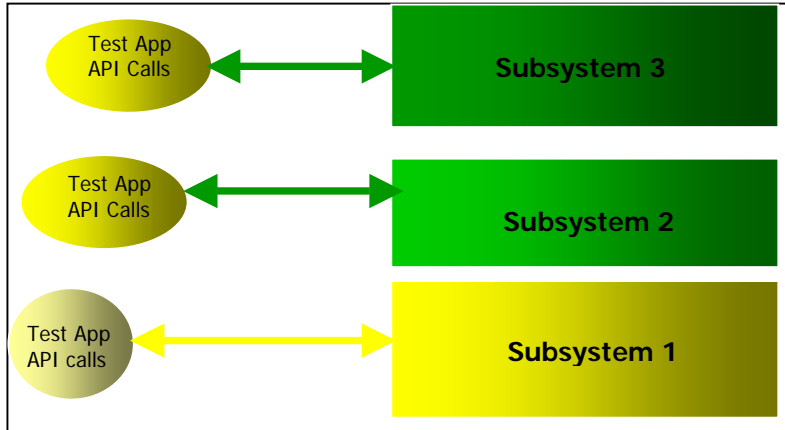
Figure 7: Schematic for Case Study # 3

The SME learned the importance of providing additional information that could develop the peripheral

vision for the offshore entity leading to effectiveness in prioritization of development and maintenance.

4.4 Case Study 4

The SME wanted to develop a new software product for the market in order to compete effectively. The product had 3 subsystems that serviced applications through API calls.



Crawl: Developed test app to exhaustively test APIs for proposed Subsystem 1.

Walk: Developed and tested new Subsystem 1. Developed test apps for two new subsystems.

Run: Developed and tested two new sub systems. Support and maintenance provided from offshore to in-house R&D team which completed the product

Figure 8: Schematic for Case Study # 4

The SME realized that a periodic planning cycle involving joint reviews, defining the work for the next cycle, and correcting any deviations achieved good results.

5 Crawl Phase

The Crawl Phase leads to the development of basic capabilities for offshore outsourcing. It is also the Pilot or a Proof of Concept) for the SME. Figure 9 shows examples of Crawl projects.

Typical Projects	Limited Demands
Development for internal use: • Application audit, support & maintenance tools, test automation tools, documentation Development of "not at risk" modules for market	Business Logic Architecture Technology
Module Test Design, Test Execution	Domain Knowledge
Maintenance for less critical bugs and modules	Release Cycles
Porting non critical apps to new platforms	Technology
New app prototyping by onshore presence	Few market needs
Level 2 support for non urgent issues	Few client issues
Existing process capabilities with improvements for hand-offs	Basic Processes, Tools

Criteria for selecting projects for the Crawl Phase should be as follows:

- Obvious partitioning of work between in-house and offshore groups leading to clear interfaces and streamlining of work-flows; Easy to measure results.
- Low business criticality in terms of customer exposure and usage.
- Rapid launch and fast execution with small offshore effort (typically 3-6 offshore people for 2-6 months).
- Small number (1-3) of in-house staff involved in the effort.

Figure 9: Typical "Crawl" Projects

5.1 Inputs

An SME needs to supply basic inputs (incur cost) for the Crawl Phase to make it successful. These inputs are Internal Preparations and Governance which represent core capabilities for offshore outsourcing.

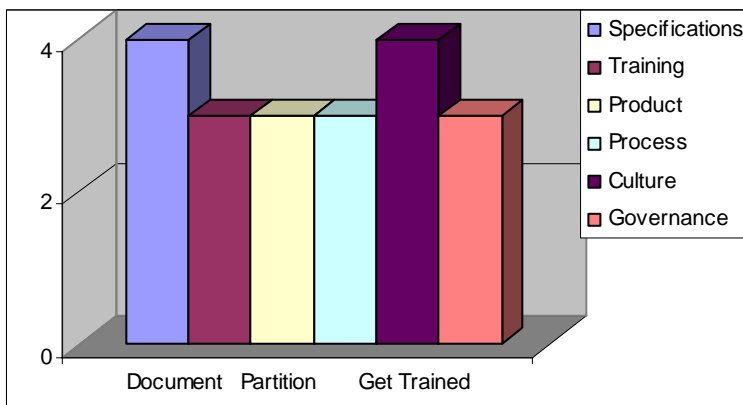
5.1.1 Internal Preparations

Internal preparations for the Crawl Phase involve “carving out Crawl projects” and could have challenges. Some product architectures may not have a clear and consistent specification of modules and interfaces, and may lack formal specifications. Training on using the products may not have been formalized, yet. Detailed designs and code may have a number of loose ends which the in-house team can work around with, due to their familiarity with each other’s work. In-house processes for supporting software development and test may lack proper hand-offs (i.e. between development and test), lack adequate automation and tools, and rely more on people implementing the right things. People may have hesitations about offshore outsourcing and about cultural differences with the offshore entities. They may also not be cognizant of the major problems related to the governance (management) of virtual teams, and the means to address communications with companies, situated halfway around the world.

These problems are not so aggravated, when the projects are executed in-house, since people have easy access to resources, and informal collaborations are effective. The only way to address these problems and make the Crawl Phase successful is to prepare [1] the Products, Processes and People for offshore outsourcing, in what can be called implementation of “offshore awareness”. Thus a basic capability to Prepare which is fundamental to offshoring success (section 3.1), should be developed in the Crawl Phase. The effort, time and cost components for this should be planned up-front.

In contrast, an SME may have well designed products and processes, and an offshore entity may also have a similar domain and technology background, with matching software engineering processes. As an example both sides may have expertise in hotel reservation systems utilizing Web services and both may follow the agile development methodology. These SMEs would also need some preparations to setup an input baseline. They should also place more demands on offshore performance via strict metrics (sec 5.2).

Figure 10 is an example of preparations. The numbers are used for representation purposes only.



Engaging in preparations is a sign of building basic capabilities for offshore outsourcing. The effort involved for each item is shown normalized with respect to the effort estimated for a 100% in-house operation (no offshore operation). It is possible to drill down further into detailed tasks if suitable (i.e. for Product Clean-up one can use effort required for interface design and development, for Process Clean-up one can choose tool selection etc.).

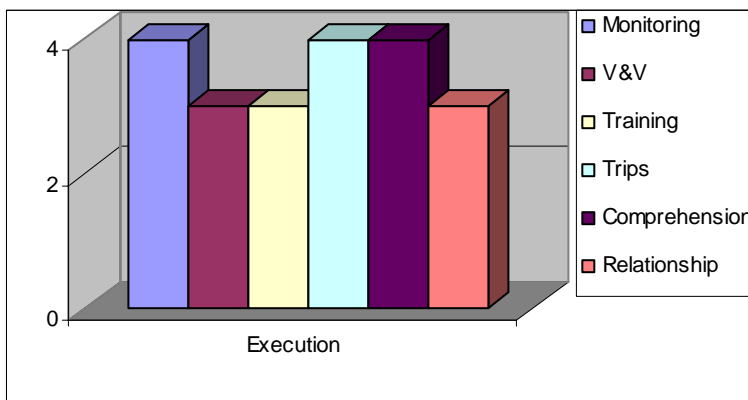
Figure 10: Internal Preparations for "Crawl"

Effective preparations pre-empt several issues that can disrupt collaborations during execution.

5.1.2 Governance

Governance of Crawl projects during execution is significantly challenging compared to managing in-house projects since offshore teams are typically situated half way around the world, and belong to different cultures, and time-zones, moreover their exposure to the business is also limited. Governance should require the in-house team to provide frequent domain knowledge training to offshore entity (entities), inspecting and testing the deliveries sent from offshore, monitor the projects on a regular basis, and handle any technical and administrative issues. Additionally trips to visit the other end (originating from either side), for knowledge sharing and work implementation, are critical for setting appropriate expectations and for team-work. There is also the imperative to nurture the relationship by an appreciation of the uniqueness of the offshore entities. Governance is also plagued by communication difficulties that lead to misalignment of expectations across the shores.

An SME should develop the basic capabilities (incur cost) to govern an offshore operation in the Crawl Phase. Figure 11 shows an example of governance activities. The numbers are used for representation purposes.



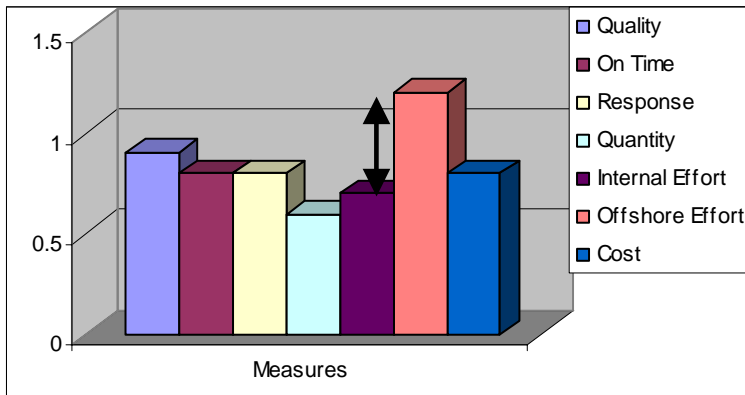
Engaging in Governance is a sign of building basic capabilities in offshore outsourcing. The effort involved is shown normalized against the effort estimated for a full in-house operation. If suitable, drill down can be attempted (i.e. for Monitoring once can use Issue Resolution Times, Escalations and other metrics). Effort, time and cost have to be allocated for governance. Effective Governance leads to control over offshore project execution.

Figure 11: Governance for "Crawl"

5.2 Outputs/Results

An SME should set the goals for the Crawl Phase based on current in-house performance levels. For many SMEs, getting to a performance level 'close enough' to in-house performance in the Crawl Phase is an indicator of success. Other SMEs may choose higher targets. It is conceivable that some SMEs may like to set performance levels more in tune with market demands, although this is in general not recommended.

Figure 12 shows an example of performance metrics and expected results. The numbers are used for representation purposes only.



All deliverables from offshore should be made to the in-house group. Targets are shown normalized against in-house performance, and some may be set to less than 1. Achievement of goals depends on the development of internal capabilities exemplified by the quality of inputs (preparations and governance) and the capabilities of the offshore group. Goals should be realistic and achievable.

Figure 12: Outputs/Results from “Crawl”

The Internal effort is normalized against a full in-house execution scenario. The arrow running from the internal effort to “1” represents in-house effort that is now free to work on value added tasks.

A drill down to detailed levels of goals can be conducted as appropriate. The Quality metric can be decomposed into number of bugs, reusability and maintainability of code, etc. On Time can be broken down into elapsed time for releases and documents produced for the in-house team. The Quantity metric can be broken down into number of scheduled releases, number of critical bugs fixed and released to the in-house team. Internal Effort represents the work involved in realizing the inputs (Preparation and Governance). Output effort is the work put in by the offshore groups (engineering + management) for execution of the Crawl Phase; typically their productivity levels would not have reached the in-house productivity levels. Cost is the overall cost in the Crawl Phase that includes the internal effort for Preparations and Governance, Offshore effort and other setup costs.

A typical squeeze on cost of offshore outsourcing involves negotiations on internal effort and offshore effort. This might have the consequences of “pushing down” the results delivered (figures 1 and 12).

It is critical to note that in case of performance below par, an SME should first review its inputs for the Crawl Phase, in collaboration with the offshore providers. The inputs (Inadequate Preparations and Weak Governance) need to be corrected, involving the necessary internal cost. Limitations in the inputs point to the absence of basic capabilities for offshore outsourcing, the SME is not there yet! The offshore entities must also check the quality and timeliness of their engineering activities for improvements. This sharing of responsibilities and lack of finger pointing, lays the foundation for a strong team that can effectively coordinate operations across the shores, in subsequent phases.

An SME should make a Commitment to an offshore operation (Walk Phase), on satisfactory achievement of the targets in the Crawl Phase, in consultation with the offshore entities. In some cases this might involve few iterations, and modifications to the original targets with associated impact on the cost and benefits of the operations. Moving from a Pilot to a Commitment, indicates that the SME has achieved a basic capability (“muscle”) for offshore outsourcing, has an understanding of offshore partnerships and is ready to progress to the next level.

6 Walk Phase

The Walk Phase leads to the maturing of capabilities for offshore outsourcing. It is also the phase in which an SME makes a commitment to offshore outsourcing.

For the Walk Phase, increased participation of in-house team members should be expected, due to the prior success of the Crawl Phase. Figure 13 shows examples of Walk projects.

Projects	Increasing Demands
More Crawl type projects	Commoditization
Development for market : <ul style="list-style-type: none"> Complex modules end-to-end Reengineering of applications with open source 	Business Logic, Architecture, Technology
Some system test design and test execution	Domain knowledge
Maintenance of some Critical Applications	Release Cycles
Taking advantage of time zone differences	Rapid Test Cycles
Porting some Critical Apps to new platforms	Technology
Parts of New Application development after prototyping completion on-shore	Understanding Market Needs
Level 2 support for some critical issues	Client Issues
Improvement of engineering and governance processes	Better Collaboration, Tools

Criteria for Walk Projects should be:

- More Crawl type of projects.
- Clear partitioning of work between in-house and offshore groups leading to further streamlining of work-flows; Easy to measure results.
- Medium business criticality in terms of customer exposure and usage; Nothing strategic.
- Controlled execution with offshore effort in the range of 4-10 people for 6-12 months.
- Taking advantage of Time Zones for segregating development and test, and customer support.
- Development of a Global Mind-Set and Establishing a Sense of Ownership in the offshore groups.

Figure 13: Typical "Walk" Projects

6.1 Inputs

Internal preparations for the Walk phase could face similar challenges as described in Section 5.1.1. However by this time, the SME should have developed better capabilities in both Internal Preparations and Governance which should make both these processes, more effective. The in-house team should now have better control over creating offshore awareness in the various artifacts (designs, specifications, code, test plans, test cases, engineering processes) that fall in the scope of offshore outsourcing. Further, it should be possible to engage key offshore team members to perform the preparations related to tying up loose ends in the products or create the specifications for a new application by spending time, in-house. Processes used in the Crawl Phase should also be critically reviewed for improvements; typically the offshore group would have major inputs in this area based on their experience with formal processes [5]. Collaboration tools should advance beyond the basic level (e.g. e-mail, chat) to more advanced (e.g. Documentation, Configuration Management, Change Control, Bug Tracking, Support others ...) levels for supporting the process improvements.

Figures 14 and 15 show the effort involved in implementing preparations and governance for new projects (non Crawl type) in the Walk Phase. The numbers are shown for representation purposes only. The effort is normalized against the effort involved in preparing for a Big Bang offshoring effort, which has not gone through the Crawl Phase. The effort should be less compared to a Big-Bang, due to the leveraging of “offshore outsourcing domain knowledge” from the Crawl Phase. Further a Big-Bang could lead to major re-work and associated “hidden cost”, while the cost associated with Internal Preparations and Governance in the Walk Phase are a) planned upfront and b) significantly less than a Big-bang activity.

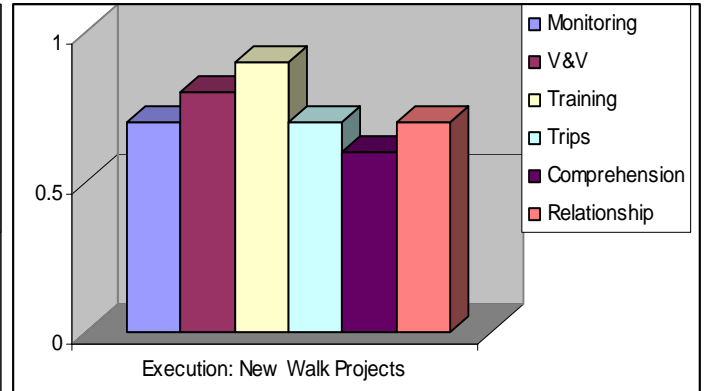
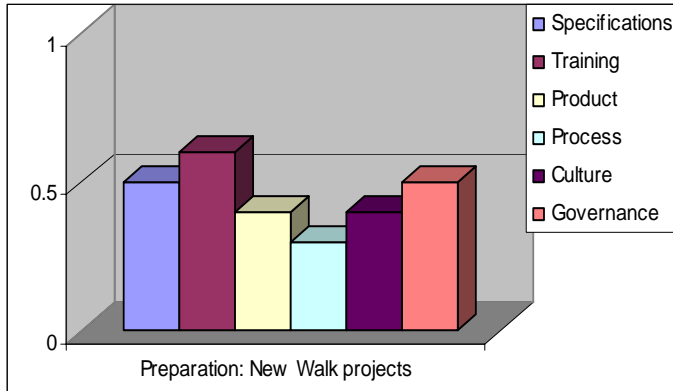


Figure 14: Internal Preparations for "Walk"

Figure 15: Governance for Walk

For more Crawl type of projects, the effort involved in Preparations and Governance should be below the corresponding numbers in the Crawl Phase (not shown). However if the new projects are executed completely in-house, the Preparation and Governance effort should be less compared to the numbers shown above, due to the proximity factor.

In the Walk phase there should be more emphasis on proactive interactions between the in-house and offshore entities. As the operations mature, the in-house group should accelerate the initiative to transfer business knowledge to the offshore entities. This should be done in ‘tiers’, lower levels should be built and tested, before moving on to the higher levels. As the offshore entities gain domain proficiency, they should be able to make more difficult technical decisions, and resolve some ambiguities in specifications, on their own. As an example, for application maintenance and enhancement, the offshore entities should be expected to design more “exception handling”, and build more robustness into the products, than what is formally specified. The in-house group should also encourage the offshore entities to ask “Why” questions related to the work, which should enable an understanding of business concepts, to prevent a Lost in Translation. A growing relationship of trust should be created [6]

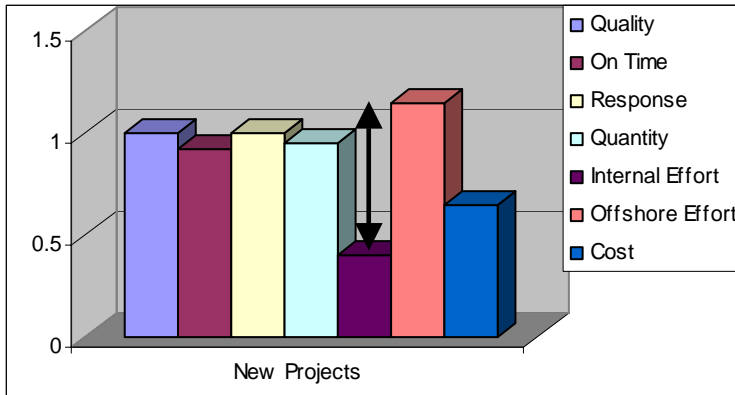
Active engagement in Preparations and Governance should enable the SME to achieve operational control on offshore outsourcing, in the Walk Phase. This is a fundamental capability, which marks a milestone in the path for realizing the company’s vision for leveraging offshore outsourcing.

6.2 Outputs/Results

While the results expected from offshore outsourcing, for the Walk Phase can be set based on current in-

house performance, it is not uncommon to set some goals, more in line with market demands. This makes the goals more challenging which is expected at this commitment stage of the operations. The goals should also be more challenging for the Crawl type of projects. The quality and consistency of inputs provided by the in-house group leading to increase in proficiencies of the offshore entities should make these goals achievable. Some goals are represented in Figure 16.

All deliverables from offshore should be typically made to the in-house group. Target levels of performance should be set higher in comparison with the Crawl phase.



Targets are shown normalized with respect to in-house performance and market demands. Many targets are set to 1. Achievement of goals depends on the internal effort (preparations and governance) and the capabilities of the offshore group. Goals should be realistic and achievable. Metrics can have additional complexities e.g. Quality metric can include software scalability and robustness.

Figure 16: Outputs/Results from "Walk"

The Internal effort is normalized against a full in-house execution scenario. The in-house effort freed up to work on value added tasks (as per the arrow) should be much larger compared to the Crawl Phase.

The process that was followed in the Crawl Phase related to performance below par should be applied in the Walk Phase as well. Sharing of successes and failures and working as an integrated team across the shores should ensure successful execution of work.

An SME should initiate a Rollout of offshore outsourcing (Run Phase) to different functional areas, on satisfactory achievement of the targets in the Walk Phase, in consultation with the offshore entity (entities). In some cases this may involve few iterations, and modifications to the original targets with associated impact on the cost and benefits of the operations. Moving from a Commitment to a Rollout, indicates that the SME has achieved a capability (“muscle”) for managing offshore outsourcing operations, has developed strong offshore partnerships and is ready to progress to the next level.

7 Run Phase

The Run Phase leads to the institutionalization of capabilities for offshore outsourcing. It is characterized by the integration of in-house and offshore operations, permeating various functional areas of the SME. This phase should involve the execution of both critical and strategic projects that have short term and long term benefits. It should be marked by the capabilities to build Winning Teams with offshore entities, based on common understanding of perspectives (sec. 3.3). Software engineering processes and management processes, supported by advanced collaboration tools should work seamlessly across the shores. Figure 18 shows examples of Run projects.

Projects	Leveraging of offshoring
More "Walk" type projects	Commoditization
<ul style="list-style-type: none"> Complete Responsibility for existing product lines for Maintenance, Enhancements, Tests, Certifications, Customer Support Active Participation in Product/Service road-map Development of new products based on design specifications Research and prototyping of new ideas 	Domain Knowledge Technology Market Needs Client Issues
Utilize Integrated engineering and management processes	Optimized Collaboration, tools

Although there should be integrated work planning leading to jointly addressing market needs, it is still critical to identify what work should be the primary responsibility of the in-house team. Market facing activities such as product planning, product architecture, design and implementation of new third party interfaces, business process modeling, and critical maintenance and support requests are some typical candidates. Ease of work partitioning should continue to remain a deciding factor for offshore outsourcing

Figure 17: Typical "Run" Projects

7.1 Inputs

Figures 18 and 19 represent the Internal Preparations and Governance effort involved on the part of the in-house group for the Run Phase, normalized against Big-bang efforts. Due to the development of significant capabilities in Internal Preparations and Governance, the effort and cost involved should be more effective in comparison with a Big-bang approach that has not gone through the Crawl and Walk Phases as shown. Further the chances of any rework, or "hidden cost" that might occur in a Big-bang effort are significantly less in the Run Phase. The Run Phase is marked by more (in some cases company wide) involvement of in-house staff spurred by the success of the Crawl and Walk Phases.

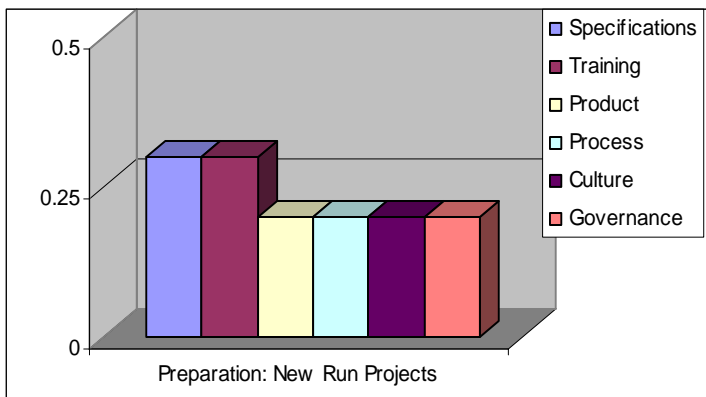


Figure 18: Internal Preparations for Run

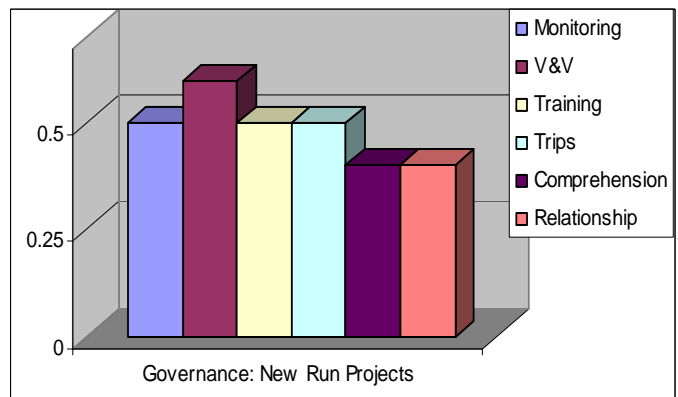


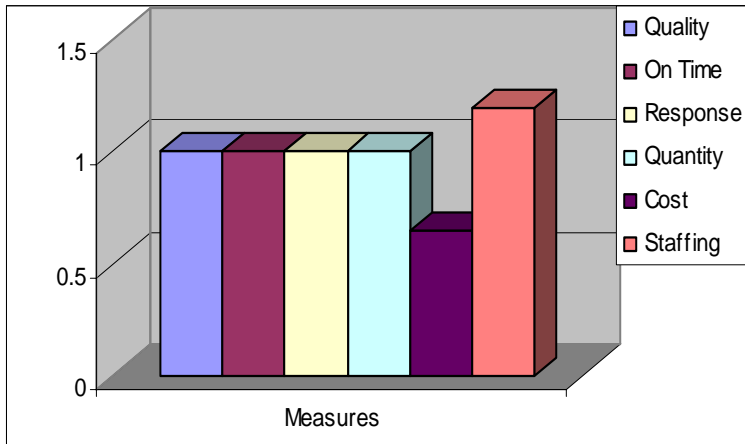
Figure 19: Governance for Run

A large part of the effort could be delegated to long term offshore providers who can station offshore personnel in-house, similar to what was done for the Walk Phase. Due to the long term nature of some partnerships, there should be more trips, more informality in communications should be established and collaborations should be enriched. In-house personnel should also spend significant amounts of time at

the offshore location. The proactive nature of the relationships should prompt each side to ask “What Next” questions, to plan out new work.

7.2 Outputs

Target performance for the Run Phase should be driven primarily by market goals. This is in alignment with an integrated in-house offshore operation that is delivering value to its customers and is shown in figure 20. As with all charts, this is used for representation purposes only.



Targets are shown, normalized with respect to the market goals and should be achievable (value set to 1). There should be a continuously ascending set of targets. In case of performance below par, the Winning Team consisting of both in-house and offshore team members should decide on the causes of failure and take remedial steps. Internal cost for preparations and governance should be viewed as essential. *The results should be compatible with the Vision represented in Figure 2.*

Figure 20: Outputs/Results from “Run”

In the Run phase, performance on the Crawl and Walk type of projects should be significantly better compared to the earlier phases. Further, due to domain knowledge acquisition, the productivity of a software or test engineer at the offshore location, should match the productivity of an engineer with the same skill level, situated in-house. Hence similar performance goals at an engineer level should be set. Additional in-house and offshore resources should be dedicated for managing joint projects and addressing global issues (the Staffing bar in fig. 20 illustrates this). Offshore outsourcing should be deeply ingrained in the organization. As an example parts of new assignments should be automatically evaluated for “offshorability”, based on the ability to partition the work and synthesize the outputs back into deliverables for customers. An SME should be living the best practices of offshore outsourcing.

8 Conclusions

In this paper we have described the merits of developing the offshore outsourcing capabilities (“muscles”) in phases, for a small to medium software organization using the Crawl, Walk, Run metaphor. This approach is suitable for small to medium size software organizations that do not have the resources to invest in Big-bang offshore outsourcing projects. We have defined a comprehensive strategy for the management of offshore outsourcing. We have described typical projects and how these elevate in complexity from one phase to the next, and how engagement in Preparations and Governance by the SME can lead to successful execution. We have included charts to represent each of the phases. We have also presented four case studies. An SME can use this document for planning an offshore outsourcing strategy. We also suggest that the SME prioritize on a few key metrics that can further highlight the fundamental ideas, presented in this paper.

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