

The GAP Principles:

Supporting IT Projects and
e-Government through Improved
Governance, Architecture and Procurement

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This paper identifies a set of principles covering IT Governance, Architecture, and Procurement (GAP)—driven by strong economic imperatives and advances in technology—that have been developed by leading private-sector organizations in recent years. The paper argues that GAP Principles can and should be adopted by the governments of developing countries. By doing so, these governments would increase the success of e-government projects and deliver significant efficiency and economic gains for local IT firms.

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Executive Summary

Microsoft commissioned a study in 1997 by McKinsey and Company to investigate how leading private-sector companies derive value from their IT investments. The results of the study were published in the McKinsey Quarterly Journal.

In the 1997 McKinsey research on IT management best practices, a Chief Information Officer (CIO) at a large financial services company indicated that the most important IT project the company was undertaking was the five-year rollout of a new branch automation system. It is doubtful whether the business base for such a protracted and expensive (U.S.\$500 million) IT transformation project could be made to an executive board today.

The most significant insight of the 1997 research was the identification of a crisis. Far from deriving value from investments in IT, many of the companies were becoming overwhelmed by the complexity of their technology environments. The companies had fallen into what came to be known as the “IT Abyss.” The crisis at many of these companies became a lot worse before they finally started to regain control in the early 2000s. In the process, these organizations did finally converge on a set of best practices now widely in use.

These best practices fall into three broad strategic areas—governance, architecture, and procurement—which are the GAP Principles.

Governance covers the internal management structures and processes to make both long-term and day-to-day IT management decisions. The goal of good governance is to make best use of a set of limited resources (money and skilled labor) to deliver maximum benefit to the business as its needs evolve over time.

Architecture is the set of standards and technologies that provide the foundation for the delivery of IT-based solutions for the business. Good architecture ensures cost-effective, reliable, and secure delivery of IT-based business solutions. Good architecture also maximizes flexibility by ensuring that, as the needs of the business change over time, these can be serviced as quickly and effectively as possible.

Procurement is the set of processes by which the resources required to meet the organization’s IT needs are acquired. Good procurement practices are designed to maximize cost effectiveness and flexibility for the organization.

Leading companies recognize that core business strategy and execution must lead and that IT plays only a supporting role. This was clearly shown by the 20 organizations interviewed for this report in 2006 by Charles Chang at Oaksmill Limited (see Figure 1 on page 10). They also recognize the strong interrelationship between each of the principles. The approach taken by these leading companies can be summarized as a set of “GAP Principles.”

“It is doubtful whether the business base for such a protracted and expensive (U.S.\$500 million) IT transform-ation project could be made to an executive board today.”

McKinsey Quarterly Journal
McKinsey & Co, 1997

Gap Principles

Governance

- *IT is a service provider to the business* – Business units and IT organizations need to be ultimately linked through managed engagement process.
- *The Chief information officer (CIO) requires real authority* – CIOs need effective authority to mandate architecture standards across organizational boundaries.

Architecture

- *The future of business is networked* – Adoption of architectures based on XML and underlying standard protocols maximise flexibility and improve speed of delivery of new services.

Procurement

- *Architecture is the foundation* – A long term, enterprise wide, strategic model is required for core architecture procurement.
- *Service oriented in architecture enables flexibility* – Shorter term tactical models can be used to procure from smaller, local or specialized suppliers.
- *Service Level Agreements alone do not guarantee success* – Good governance and architecture are required to enable effective operations outsourcing.

A coordinated approach to these GAP Principles facilitates obtaining business objectives through IT and is central to the effective management of IT investments.

IT Challenges Facing Governments

The economic pressures that shaped the development of the GAP Principles in leading private-sector organizations were not generally felt in government. These best practices have not typically been adopted in the public sector, nor has the deep causal linkage between governance, architecture, and procurement been recognized.

In 2004, the World Bank lent more than U.S.\$1 billion to fund IT projects in support of government transformation initiatives in developing countries. By the bank's own estimates, more than 80 percent of all their funded projects include some form of IT component. Over half of these projects suffer some form of failure, ranging from late and over-budget delivery of planned systems to outright cancellation of projects.

Even in developed economies, the success rate of government IT projects is depressingly low. The United Kingdom (U.K.) National Audit Office highlighted the issue in a recent review of U.K. government performance. It is therefore unsurprising that developing-country projects suffer from similar failures. There are major barriers to the adoption of the GAP Principles by governments. It is often the case that structural autonomy between organizations creates significant barriers to the creation of a single integrated governance model for IT strategy.

Technology typically follows the structural rigidity of the organizations deploying it, resulting in stovepipe project implementations isolated from any overall integration or government-wide architecture strategy.

Government CIOs, if they exist, often lack real authority across departmental and ministerial boundaries. Politicians sometimes see technology projects as trophies and electoral tools rather than true instruments of change.

Government procurement practices often lack the flexibility to acquire technology in a way that benefits both smaller local suppliers and the government itself. It is here that the GAP Principles possibly have the opportunity to contribute most. Implementation of the GAP Principles would dramatically improve the chance of building a sustainable ecosystem of local software and IT service providers.

Why IT Matters to Governments

The approach to architecture outlined here would ensure that large scale projects are split into smaller, more digestible application or service components. This would help smaller, local software entrepreneurs who are reluctant to take on the risk associated with large, complex government projects.

The benefits to governments adopting the GAP Principles can be summarized as follows:

Benefits of GAP Principles to Governments

- They support the transformation agenda underlying e-government projects more effectively.
- They enhance the speed and efficiency of government service delivery supported by IT.
- They act as a key stimulant to economic growth by ensuring efficient transfer of funding to local software companies and IT services providers.

Failure to apply the GAP Principles will likely ensure the continued poor performance witnessed in many e-government projects today and a continued lack of opportunity for local technology suppliers in these developing economies.

International financial institutions (IFIs), such as the World Bank, have a pivotal role to play in driving the adoption of these “GAP Principles” to improve the use and effectiveness of IT in support of countries’ development objectives.

Benefits to IFIs

- They help governments achieve their development objectives, including the benefits highlighted above.
- They ensure the most effective use of loans and grants for e-government initiatives and thereby improve the return on the investment and development impact of IFI funding.

The “GAP Principles” can and should be applied by the governments of developing countries. Adoption of these principles would help governments to harness IT more effectively in support of development objectives.

Private-Sector GAP Evolution

It is useful to review the history of Governance, Architecture, and Procurement (GAP) in the private sector. At any time, there is obviously a broad spectrum of approaches to GAP in the private sector. By necessity, this review identifies only the “macro” concepts.

Prior to the mid 1970s, organizational IT was largely dominated by centralized mainframe computers with little or no distributed computing resource. The status of the GAP Principles can be summarized as:

- **Governance:** Centralized IT department control
- **Architecture:** Centralized mainframe computing
- **Procurement:** Sole source

Emergence of Departmental Autonomy

The availability of smaller, cheaper mini computers by the mid 1970s to mid 1980s led to increased departmental distribution of information-systems resources across the organization. The GAP Principles evolved into:

- **Governance:** Centralized control with increasing departmental autonomy
- **Architecture:** Centralized mainframe with departmental computing
- **Procurement:** Multi-source

The Power of the End User

In 1981, the original IBM Personal Computer was launched. While PCs had been available for some time, it was IBM's backing for the format that convinced companies that this could be treated as a serious business computing device. The availability of low-cost desktop computing devices led to complete departmental IT purchasing autonomy in many organizations. The GAP Principles morphed into:

- **Governance:** Federated tending toward Anarchic (No central control)
- **Architecture:** Client/Server (PC Client <-> PC Servers <-> Mini-Computer <-> Mainframe)
- **Procurement:** Best-of-breed (Hardware and software)

This “Anarchic” governance model created a situation in many companies that led McKinsey & Company to coin the expression “IT Abyss” to describe the situation into which many companies seem to have fallen. The “IT Abyss” was identified by four key characteristics:

Characteristics of the “IT Abyss”

- IT spending grows rapidly, becoming an increasingly visible component of a company's overall budgets.
- An increasing share of IT budget is spent on maintenance and systems integration, rather than on delivery of new capability.
- Complexity of distributed computing environment explodes, driven by rapid expansion in a number of computing devices, and a lack of defined interoperability standards.
- Ineffective new development.

For many large, private-sector organizations, IT complexity was proving to be financially and operationally untenable.

Emergence of the Internet

Just as companies began to realize that they were overwhelmed by the complexity of their IT environments, the worldwide network erupted in the shape of the Internet. Many companies that had started to climb out of the abyss rapidly fell back into it. Sadly, the GAP Principles—in terms of governance and procurement—deteriorated into:

- **Governance:** Completely Anarchic (Complete devolution of IT purchasing authority to divisions and departments)
- **Architecture:** Web/Internet distributed computing (Implementation of “Boutique” and often unproven Web technologies)
- **Procurement:** One of everything

2001: The Crash

Three events eventually focused the attention of companies to the point where radical overhauls of their IT infrastructures became necessary.

- Year 2000 bug (Y2K)
- The stock market crash
- The 9/11 attacks

The individual impact of each of these events was quite different. The Y2K bug required all businesses to inventory their IT systems. The obvious risks associated with such a largely unmanaged IT environment resulted in a serious reappraisal of IT governance.

The stock market “crash” and subsequent economic downturn led to a significant reduction in capital available for IT “investments.”

And the terrorist attacks on the 9/11 World Trade Centre reminded all senior executives of the importance of business continuity.

The combinatorial effect of these three events was pivotal in establishing the importance of the GAP Principles for today’s leading companies.

Moving Toward Recovery

The period since the events of the early 2000s has found companies dealing with an extremely difficult global economic climate. This has led to a much clearer focus on core businesses, the implementation of effective strategies for those businesses, and operational excellence in all aspects of the business, including IT.

Recent Gartner research indicates that the expected period for a positive return on investment for IT projects in large organizations is now less than 18 months. In many cases, it is less than 12 months. This focus on efficacy comes at a time when companies are realizing that well-managed IT can be a highly effective driver of the business.

Fundamental to all leading companies today is an understanding that an effective IT strategy requires an integrated approach to governance, architecture, and procurement—causing companies to implement the GAP Principles.

GAP Principles Explained

Why have organizations adopted the GAP Principles? Figure 1 shows the 20 organizations that Charles Chang at Oaksmill Limited interviewed in the first half of 2006 and their adoption of the GAP Principles. The extracts cited in the rest of the report are drawn from the detailed interviews. Please note that the views expressed from the respondents to this survey and quoted in this paper are not necessarily representative of those of their employers.

The reasons these organizations adopted the GAP Principles were:

- To align IT investment with business strategy and objectives.
- To improve the value of IT by prioritizing against business objectives.
- To reduce costs and optimize investment by reducing duplication and exploiting local solutions and expertise.
- To foster collaboration and improve relationships between different business units and between business units and the IT organization.

Figure 1: Adoption of the GAP Principles by the case organizations

	Main Gap Principles				Additional or Subsidiary Principles			
CASE	GOVERNANCE	ARCHITECTURE	PROCUREMENT	PROJECT MANAGEMENT	PORTFOLIO MANAGEMENT	RELATIONSHIP MANAGEMENT	BENEFITS MANAGEMENT	OTHER FACTORS
ABB	Practising	Practising	Practising	Practising locally	Planning to practise	Practising locally	Practising within project management	Vendor management
BBC	Practising	Practising	Practising	Practising	Practising	Practising (customers and vendors)	Planning to practise	
BCAA	Practising	Practising EA and TA	Practising	Practising	Practising within governance	Practising (customers and vendors)	Practising within project management	Business engagement and collaboration
Belgian Smals-MvM	Practising (incl. external stakeholders & clients)	Practising TA	Practising, follows EU rules	Practising	Not practising (too many stakeholders)	Practising (pseudo commercial organisation)	Practised by individual stakeholders & clients	Quality and cost control
BP	Practising	Practising	Practising	Practising	Practising	Practising	Practising within project management	
BT Auto-ID Services	Practising	Practising TA	Practising	Practising		Practising (commercial organisation)		
Codelco	Practising	Practising	Practising	Practising			Practising	Value engineering
Electrabel	Practising	Practising EA and TA	Practising	Practising	Practising within governance	Practising	Starting to practise	
Exel Logistics (Now DHL)	Practising	Practising EA and TA	Practising	Practising locally	Not practising (too many different customers)	Practising		Behaving commercially, innovation
Fairfax County, VA	Practising	Practising	Practising	Practising	Practising within governance	Practising locally	Practising within governance	Business collaboration, risk management
ICE, Costa Rica	Practising	Practising	Practising	Practising		Practising		
Marsh Europe	Practising	Practising	Practising	Practising	Practising within governance	Practising within governance	Practising within governance	Business ownership
Powercor	Practising	Practising (hybrid)	Practising	Practising		Practising (customers and vendors)	Starting to practise	Innovation
PwC Eurofirm	Practising	Practising locally	Practising	Practising locally	Practising locally	Practising locally	Practising within project management	Change management
PwC UK	Informal	Outline EA, detailed TA	Practising	Practising (new PMO)		Practising (customers and vendors)	Practising (customers and vendors)	Change management
Reebok	Practising	Practising EA and TA	Practising	Practising				Business knowledge, business analysis, risk management
SKF	Starting to practise	Practising EA and TA	Practising	Practising	Practising within governance	Practising	Practising within project management	Compliance (Sarbanes-Oxley), Security
State of Victoria, Australia	Practising	Practising, part-way between EA and TA	Practising	Practising	Practising	Practising (also vendor relationship)	Practising within project management	
UK Department for Work & Pensions	Practising	Practising locally	Practising	Practising locally	Practising within governance	Practising locally	Practising within project management	CMMI, Innovation
UK Office for National Statistics	Practising	Practising (mainly TA)	Practising	Practising				Business analysis and planning

Governance

"IT governance must not be:

- Bureaucratic—minimize reports and focus on decisions.
- Manipulative—avoid 'back-room' decisions.
- Obstructive—be clear about why something has been rejected.
- Inconsistent—do not play favorites.
- By-passed—have a procedure to stop unauthorized or architecturally non-conformant projects."

Roger Flory,
Managing Director of
Business
Technology, Marsh Europe

Description

Governance covers the internal management structures and processes put in place to make both long-term and day-to-day IT management decisions.

The implications for governance start by defining architecture and its associated standards. These minimum standards must be defined and adopted across the establishment. The CIO and IT organization have the responsibility for defining the core architecture and ensuring it evolves to meet the changing needs of the business. This is where the first two GAP Principles come into play.

The IT organization and business units must agree upon and implement a structured set of engagement processes that ensure IT is aware of the future needs of the business. "Best of Class" IT organizations implement an Engagement Manager or Account Manager role responsible for engaging with a specific business unit, understanding their needs, and feeding this back into the IT planning processes. The person in this role typically understands both the needs of IT and the business with which he or she is engaging.

There is always a tension in large organizations between the power of the businesses and their desire for flexibility and the power of the IT organization and its desire to control complexity. This power has swung dramatically over the history of organizational computing. One extreme, with power in the hands of end users and departments, was reached in the late 1990s, followed swiftly by a recentralization of power into the hands of IT in the early 2000s.

The move to service oriented architecture (SOA), with its standards-based interfaces, will increasingly open up opportunities to ensure more flexible outsourcing or off-shoring. Open-standards-based architecture such as SOA facilitates integration of the outsource partners' systems. If the partner also adopts an SOA approach, then they need not replicate the infrastructure of each of their individual clients. They only need to integrate their own systems through the well-defined SOA interfaces. Several leading organizations are already using these approaches to facilitate off-shored back-office processing and development work.

Accomplishing these goals does require adoption and adherence to the defined SOA and infrastructure standards for the organization. In "Best of Class" organizations, this requires a CIO with effective authority over this architecture and its associated standards. The CIO must set those standards in consultation with the business and then enforce adoption of those standards across organizational boundaries. By definition, this requires the CIO to report to someone who can make those cross-enterprise decisions in a company—the CEO, CFO, COO, or board and the Minister of IT, Communications, Finance or some other equivalent in government.

How Governance Works

Organizations used the following approaches when implementing IT governance, and many were successful by setting up a committee structure. The organizations interviewed had typically set up three levels of committee.

1. **Top level:** an investment committee, usually a subset of the executive committee.
2. **Middle level:** an applications committee or committees.
3. **Bottom level:** an architecture board, which underpins the higher-level committees.

Figure 2: Typical IT Governance Structure (Source: Marsh Europe)



- Senior business representation, 10-12 members each – top committee is European Board level.
- Agree strategy and investment priorities supported by ETG technical and financial input.
- Aligned to business processing characteristics rather than the business matrix, to relate more directly to technology needs.
- Distinguishes pan-European and strategic initiatives from local technical needs.
- Meet quarterly with additional fast-track interim process.
- Chaired by business; ETG supplies data, facilitates and records

- Engaging business colleagues and IT leaders through “socializing” activities and in some cases bringing in consultants to start the process.
- The IT steering committee monitors the entire IT project portfolio to assess whether the investments are providing the expected benefits. This monitoring process provides a broad perspective for senior executives who independently and objectively evaluate and make decisions on the overall status, mission needs, and priorities for the organization.
- Multiple structures work well together, with each level taking decisions within its scope and making recommendations to the higher level as appropriate. The whole is underpinned by the architecture board, which gives advice and warns when projects are non-compliant.

Benefits ...

The interviewees identified several benefits associated with adopting IT governance, mainly for the business, but also for the IT organization. Reported benefits included:

- A 30 percent saving on standard desktops and laptops that could not have been achieved without the IT governance mechanism.
- It is now easier to check whether a new initiative conforms to the architecture:
 - Reasons for approving and rejecting investment decisions are now transparent and objective.
 - Annual savings of £2 million (U.S.\$3.8 million) from cancelling projects that could not be justified, but would have been approved under the old mechanism.
 - The risk of failure has been reduced. Overspends and overruns have also been cut.

“IT spend is now closer to business objectives and indirectly made savings of over 20 percent of IT budget.”

Haider Rashid,
Group CIO, ABB

"Change of mindset was achieved mainly through continuous face-to-face communications."

Dayantha Joshua,
CIO, UK Office for National Statistics

"Don't neglect political and cultural issues. Do manage expectations."

Marco A Orellana,
Silva, CIO, Codelco

... Obstacles

Most of the concerns expressed by the sample concerned loss of power or increased bureaucracy. They were overcome through persistent "socializing." The main obstacles to implementing a new or changed IT governance structure were:

- Perception of loss of power: This is real for those who exercise more power than their business unit warrants, but unfair to others.
- Resistance to change: Dismantling old mechanisms, however inadequate, inevitably raises objections.
- Aversion to formal governance: Initially, formal governance procedures were seen as an obstacle by many project managers and staff.

Communication is Paramount

The main IT governance lessons from the case histories are communicate, communicate, and communicate—both when setting up a new governance process and once it is working. People will need hands-on support to accept the new process.

Do

- "Sell" the value of IT governance to business management and IT workers, and getting senior business managers committed is critical. This also means taking the time to "socialize" the model adopted and then adapt it.
- Setting a realistic timescale is critical, as is using metrics to monitor and show how governance decisions are (or are not) being implemented.
- Organizations with a mix of large and small business units should select the governance committee carefully so smaller units do not feel that larger ones are dominating unfairly. The same applies to geographic representation, where smaller regions should not feel their needs are being ignored.

Don't

- Assume "one size fits all." Start with a standard method, but tailor it to the firm's specific circumstances. This also means not over-complicating IT governance. Stop when the governance process is sufficient.
- Formalize the process or communicate it until influential stakeholders have bought into and validated it.
- Assume the IT governance structure will not change once it has been set up; there will always be the need for change.

Model Architecture

Architecture is the set of standards and technologies that provide the foundation for the delivery of IT-based solutions for the business. Good architecture underpins cost-effective, reliable, and secure delivery of IT-based business solutions. Good architecture also maximizes flexibility by ensuring that, as the needs of the business change over time, they can be serviced as quickly and effectively as possible.

The core standards upon which the Internet and Web infrastructure is built not only add to the complexity problems faced by large organizations, but also become the seeds of a solution to the problem.

Service orientation is now recognized as an effective approach to addressing past concerns about architectural complexity and the need to provide flexible and responsive systems to support complex businesses. The benefits from implementing a Service Oriented Architecture (SOA) are seen as compelling. Most leading companies are already well advanced in their plans for implementing this approach.

Benefits of a Service Oriented Architecture

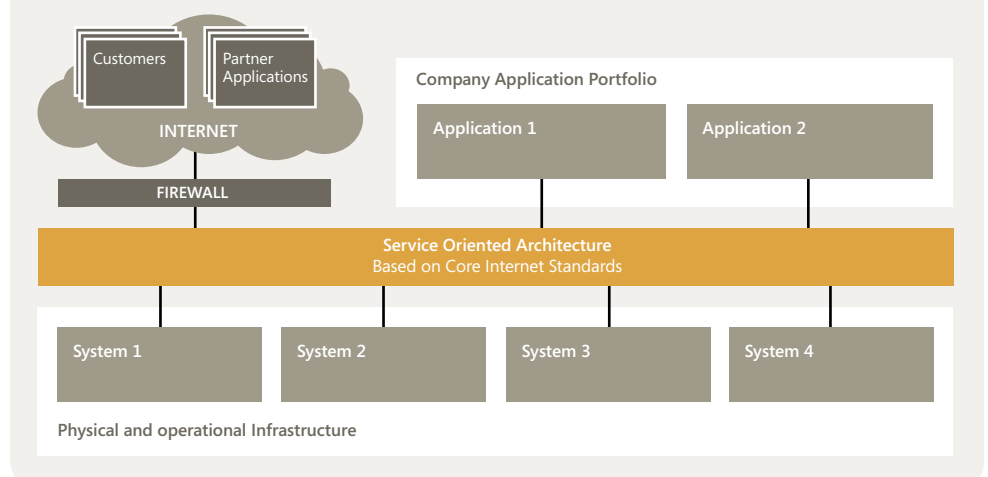
- *Vendor neutrality* – An SOA is based on a set of open standards that have been widely embraced by the vendor community. They facilitate interoperability between applications and systems..
- *Speed* – Applications built on SOA principles have well-defined and interoperable interfaces. Adding new functionality requires less system integration and can be delivered more quickly than with previous architectural approaches.
- *Cost* – The complexity of building distributed applications is reduced by using well-defined interfaces based on open standards. This improves developer productivity and reduces systems integration costs.
- *Flexibility* – An SOA hides or abstracts the underlying physical complexity of the IT infrastructure. Once an SOA has been implemented, IT organizations can add or remove capacity to meet changing demands without having to re-write the applications.
- *Extensibility* – An SOA is based on the same open standards used in the Internet. This makes it much easier to connect customers and partners to services running on the corporate infrastructure.

The implementation of an SOA approach has direct implications for IT governance and procurement.

A typical technology architecture framework can be simplified down to three layers that include an application layer, the integration layer (sometimes using SOA principles), and an infrastructure/platform layer (see Figure 3).

Real-world architectures are inevitably more complex, but this three-layer model will serve to illustrate the key connections between governance, architecture, and procurement.

Figure 3: Typical Technology Architecture Framework (Source: Microsoft)

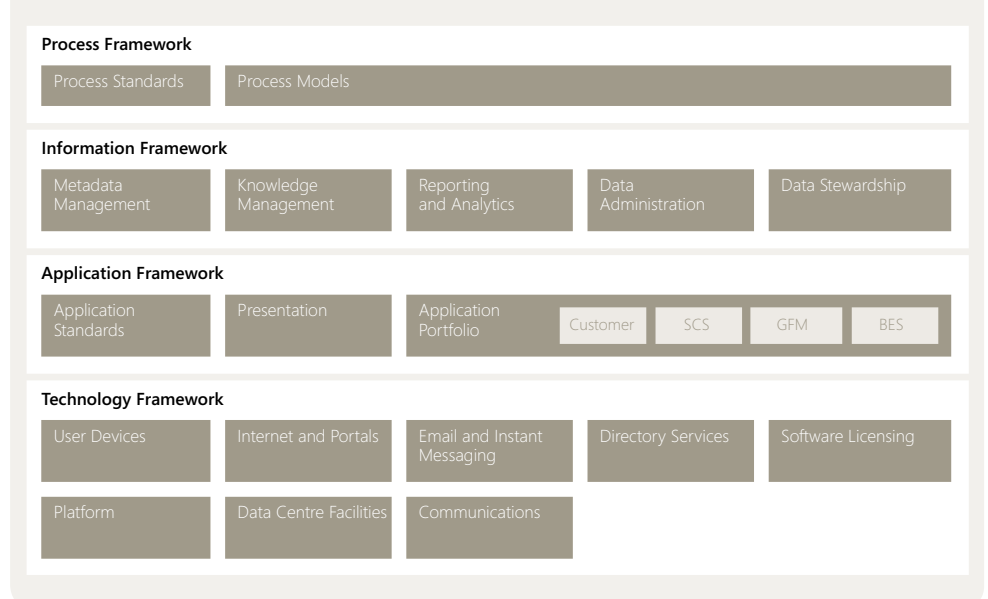


New Approaches Evolve

Several of the organizations used different approaches to developing their IT architecture, depending on their initial starting points:

- Those that have developed an enterprise architecture have typically done so at an outline level. A fully defined enterprise architecture requires business managers to model business processes and agree on a common information model. The cost would often be more than could be justified by the expected return.
- An enterprise architecture framework typically has four layers:
 1. Process layer
 2. Information layer
 3. Application layer
 4. Technology layer

Figure 4: Typical Enterprise Architecture Framework (Source: Exel Logistics (now DHL))



"IT costs alone are 20 percent less expensive if a global architecture was followed, compared to each country going separately. The financial unit estimated that harmonized financial processes following the architecture will cost 6 to 7 percent less."

Ludo Van den Kerckhove,
CIO, Electrabel

- Several organizations set up an architecture board to manage the process, often below the governance committee. Some also used consultants to educate their own people so they could become self-sufficient as quickly as possible.
 - In organizations with multiple business units, each significant unit has a representative on the architecture board to ensure the unit's views are taken into account and to foster ownership by the business unit.
 - Another large IT department formed a strategy and architecture team, which varied between 12 and 18 people, to prepare a "blueprint." Business colleagues were involved to ensure the blueprint was aligned with business objectives.
 - One organization followed three kinds of architectural principles:
 - *Mandatory*: A project must comply with the standard unless it has prior, explicit approval from the architecture board.
 - *Consultative*: A project can diverge from the standard, but only after consulting the architecture board.
 - *Advisory*: A project can diverge from the standard without consulting the architecture board, but should inform it.

Measurable Benefits

The sample reported real and often measurable IT architecture benefits:

- The efficiency of application integration work improved by up to five times, notably when there was a need to integrate with the systems of a newly acquired customer.
 - The architecture helped the applications portfolio to be rationalized and reduced, with related cost savings.
 - Having an architecture increased the speed of decision making.
 - The benefits from re-use are beginning to be seen, especially on integration projects.
- The relationships with business colleagues have improved. They now collaborate with IT workers on defining business processes and understand why they should invest time and effort.
- For examples in the U.K.:
 - The technology architecture ensures queries about 2001 U.K. Census data (available online) are processed with little or no effort. The cost of processing these queries is much lower than for the 1991 Census, which is unavailable online.
 - The technology architecture has helped increase revenue from genealogical searches by eight times since 2003. Eighty percent of revenue from searches for birth, death, and marriage registrations is now generated online.

Challenges to Overcome

The biggest obstacle to defining an IT architecture and ensuring compliance with it is changing the mindset of employees. Another obstacle is the perception that a common architecture will lead to a loss of autonomy and power. The feedback regarding the obstacles to implementing IT architecture was:

- Developing an enterprise architecture meant engaging people across the enterprise. It was also necessary to "sell" the concept and explain how much had to be invested up front.
- Not having a "central" IT budget—only project-oriented and operations budgets—made justifying architecture expenditure more difficult.

"Don't let IT people untrained in procurement engage with suppliers directly. Their technical bias makes them attracted to the features"

Dominique Moreau,
CIO, PwC UK

"Don't spend too long on the initial study; start showing results, ideally a few months from the start."

Andy Bryan,
Head of Architecture,
Exel Logistics (now DHL)

Lessons Learned

The case histories show that, as with other IT work, delivering and demonstrating the value of IT architecture early is important to maintaining momentum. The specific lessons are:

Do

- Ensure the CEO is convinced that defining an IT architecture is a business-transformation activity rather than a cost-saving technology program.
- Start small with achievable architecture projects and let business people who will benefit promote those benefits to their peers.

Don't

- Use a common IT architecture as a tool for rationalizing the business structure or try and "sell" architecture on its theoretical merits. Business people like to see practical examples.
- Rely too much on external consultants. Use them to kick-start the process of defining the architecture and educate the firm's people. "Own" the architecture.

What is Procurement?

Procurement is the set of processes by which the resources required to meet the organization's IT needs are acquired. Good procurement practices are designed to maximize cost effectiveness and flexibility for the organization.

The three-layer architecture in Figure 3 implies that procurement can be broken into three models: procurement for core architecture services, procurement for operational infrastructure services, and procurement for applications and application services. Each of these requires a different approach in terms of vendor selection, time horizons, and selection criteria.

Selection of vendors for core architecture services is typically based on several criteria. These include the vendor's long-term viability and the ability of the vendor's technologies to drive down costs, improve manageability, and increase flexibility for the organization. It is also quite common for large companies to undertake a road mapping exercise. Leading companies define a template architecture and road map to show how the architecture will need to evolve over time to meet the needs of the business. Vendors are then asked to overlay their product offerings on this roadmap so the customer can evaluate breadth, depth, and timing of capability delivery. This approach is used to narrow the vendor selection down to a few companies that have the broadest and deepest fit with the template architecture.

New Approaches to Procurement

The SOA approach perhaps opens up the most interesting opportunities for procurement of applications and applications services. Large-scale projects will still require deep project management, analysis, and system design skills to ensure the final systems are well characterized and meet performance and other service level commitments. These depth skills will often only be found in the larger system integrator companies and will need to be procured. However, the SOA approach abstracts the physical and operational infrastructure through a set of standard and well-defined interfaces. Large-scale applications can now be decomposed into smaller, less complex applications services. Development and integration of these services becomes much more straightforward because of the open standards and interfaces being used. These smaller application services can now be built and integrated by smaller, perhaps local vendors who will offer lower costs and improved flexibility and versatility.

The procurement model for applications and services therefore moves to a two-track approach: acquiring project management and design skills from the traditional systems integrator channel and sub-contracting applications service module development to smaller, more flexible, low-cost software development companies based locally. This last point serves as an additional incentive to stimulate growth of the local IT sector.

In the sample of companies interviewed, IT procurement was implemented in a fairly straightforward manner, often after consulting the corporate procurement function and usually involving business executives. The sample described the following approaches:

- In an organization where IT was wholly outsourced, a senior IT executive with prior experience of a successful vendor management role in that organization was appointed head of the vendor-management unit. His first action was to set up a professional procurement function and create guidelines and procedures (labeled the "call-off process") for procuring IT within the organization's outsourcing contract. He also provided guidelines for small IT procurements outside the contract.
- In one organization, the IT procurement process was developed jointly with the corporate procurement function.

"The procurement process has yielded very tangible benefits, lowering costs by 20 percent in a historical comparison."

Ken Ontko,
CIO, British Columbia
Automobile Association

"The challenge is to build proper business cases. It is relatively easy to estimate the cost, but much harder to estimate the benefits of a project."

Glen McLean,
CIO, Powercor

Reasons for the specific IT procurement practices are summarized below:

- ***Do you use a best-of-breed approach or prefer a single vendor and architecture?*** Most preferred the best-of-breed approach, with a separate choice made for each technology category defined by the technology architecture (servers, desktops, database, and so on).
- ***Do you have framework agreements in place?*** Most had such agreements in place, which means that, once a vendor has passed the selection criteria for a technology category, it does not need to tender again each time new equipment or a new service is required. However, the vendor has to demonstrate it is continuing to deliver value.
- ***Do you use a best-value or lowest-cost approach to IT procurement?*** Most preferred a least-cost approach, either because of public-sector procurement rules or because of corporate guidelines. Several firms, however, stressed that no major IT purchase was made solely on cost. Fitness for purpose was also an important criterion.
- IT procurement in the case study organizations proceeds well. Government and regulated industries need to comply with external rules and regulations for procurements above certain thresholds.

What Works Well

While some case studies could cite only soft benefits, others cited the following, fairly substantial hard benefits when adopting the IT procurement principle. They showed that formal processes improve the efficiency of IT procurement, reduce procurement costs, and sharpen the focus.

- The procurement process helps one organization to make IT choices on a "whole of business/enterprise" basis, rather than in a piecemeal way driven by individual requirements.
- Where a formal procurement process replaced an informal one, the formality often brings side benefits, such as a more considered definition of requirements.
- In deals that wholly or largely outsource an organization's IT, there is sometimes an immediate pay-off. The vendor either takes on the capital cost of the assets or is contracted to pay the client up-front some or all of the projected savings for the first n-years of the contract—in effect, a guaranteed productivity improvement.

Challenges of Procurement

The sample identified some obstacles to implementing IT procurement, but these were less significant than the obstacles to implementing governance or architecture principles. Specific obstacles mentioned were:

- In organizations that already had informal procurement processes, the change to a formal process was seen as bureaucratic and the cause of a loss of power.
- Where there was already an informal process, it took time to educate and train procurement executives to write good requests for information (RFIs) and requests for proposals (RFPs).
- Several organizations faced internal cultural issues when they introduced formal IT procurement practices, particularly a perceived loss of power by divisions that used to do their own procurement.

Lessons Learned

The lessons learned in the case studies had more to do with vendor management than with IT procurement itself.

Do

- Standardize procedures for carrying out financial analyses and preparing proper business cases so the cost/benefit is clear and comparable between different proposals.
- Take time to measure the "before" key factors so the "after" performance can be measured correctly.

Don't

- Predict the market, test it.
- Sell yourself short—you can always say "no."
- Take the risk alone; share it with the vendor.

GAP Principles in Developing Countries

Most commentators would agree that IT can have marked benefits for developing nations when implemented appropriately. Effective IT systems can improve the transparency of government, helping to increase integrity. They can improve efficiency and help reduce red tape and bureaucracy, which has direct benefits in improved services for citizens and businesses. Government implementations of IT can also act as a catalyst for the development of local IT skills and local software and IT service providers.

- The adoption of the GAP Principles by developing-nation governments would deliver significant benefits. Most notably, implementation of the GAP Principles would increase the opportunity to build a sustainable ecosystem of local software and IT service provider companies, while building up one's own IT infrastructure and the requisite eGovernment Services.
- In most developing nations, the government is the single largest procurer of IT. Adoption of the GAP Principles could ensure more of that spending ends up in the hands of local software companies and IT services providers.
- By applying the GAP principles and improving access to government IT projects, a virtuous cycle of growth and development can happen within a country. The government's IT projects would more successfully and rapidly be completed, while fostering the growth and expansion of its local IT industry.

The IT initiatives to support government transformation projects in developing nations are often underwritten by IFIs, most notably the World Bank. The World Bank and other IFIs are not aid agencies. They provide funding with an expectation that the loans will be repaid. They therefore care about the efficiency with which funding is applied and the effectiveness of the projects that are funded.

The executive directors and boards of these IFIs should be concerned about the poor performance and high failure rate of many e-government projects. These projects are consuming valuable and limited funding resources and failing to provide the returns or improvements to government development objectives, transparency, efficiency, and improved services to citizens one might expect.

For these reasons, the World Bank and fellow IFIs should have a vested interest in ensuring recipient governments adopt best practices that improve utilization of funding.

One of the benefits many organizations are seeing from a standards-based approach to architecture is an ability to move to a shared-services or outsourced-service model for the operational infrastructure. Most leading organizations moved, sometimes dramatically, in this direction.

The abstraction afforded by a service-oriented and standards-based architecture ensures more effective partitioning of the operational infrastructure and more flexibility in geographic hosting of services. As an example, one global oil company has reduced its data centers over the last five years from 14 to just three. This consolidation of physical infrastructure has direct benefits in reduction of costs, as well as improvements in reliability and operational service levels.

Proposed IFI Action Plan

- Make implementation of the GAP Principles mandatory before funding IT projects.
- Make GAP planning and implementation a core part of Country Assistance Strategy development.
- Use existing knowledge-sharing processes to further illuminate and identify best practices in IT governance, architecture, and procurement.
- Adjust procurement practices to recognize the differences between procurement for architecture, applications, and operational infrastructure.
- Ensure funding flows through local software companies and IT services providers.

Summing Up

IT is not a cure all for the development challenges of emerging-market economies. However, it can play a significant support role. Governments today are facing a set of global economic challenges that need solutions.

The GAP Principles are a distillation of best practices from leading private-sector organizations. Most, if not all, of these organizations have global operations, which benefit when governance is improved in developing nations. Each of these companies, therefore, has a vested interest in seeing the GAP Principles applied by governments around the world. IT leaders in these companies would often be willing to partner with government leaders to exchange ideas and best practices if an appropriate forum were created for such an exchange.

Developing-nation governments face many challenges, particularly in the provision of basic services such as clean water, food, healthcare, shelter, and economic opportunity for all citizens. IT is not the answer to these problems. However, effectively implemented IT, with good governance and architecture, can support and speed up the achievement of development objectives with the broadest benefits for society. Badly implemented and poorly governed IT will only waste valuable resources, benefiting no one.

Appendix

IT Governance

Definitions of IT governance

"IT governance is about assigning decision rights and creating an accountability framework that encourages desirable behavior in the use of IT."

"Effective IT Governance by Design" (January 2003), MIT Center for Information Systems Research (CISR), Sloan School of Management and Gartner's Executive Programs (EXP). This report also identifies five domains of IT governance: "maxims" or policies, infrastructure strategy, architecture, business application needs, and investment and prioritization. <http://web.mit.edu/cisr/>

"IT governance is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure the organization's IT sustains and extends the organization's strategies and objectives."

The IT Governance Institute www.itgovernance.org

Further reading

Weill, P. and Woodham, R., *Don't Just Lead, Govern: Implementing Effective IT Governance*, Working Paper 326, MIT Sloan CISR, April 2002

IT Architecture

Definitions of IT architecture

"The fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution."

ANSI/IEEE Standard 1471-2000

"Enterprise architecture (EA) is a conceptual tool that assists organizations with the understanding of their own structure and the way they work. It provides a map of the enterprise and is a route planner for business and technology change."

Michael Platt, Microsoft (published in an article on the IT Architect Institute's Web site) <http://www.itarchitect.co.uk/articles/display.asp?id=33>

Further reading and useful Web sites

Ross, J.W., IT architecture and business strategy: rethinking the relationship, MIT Center for Information Systems Research, Sloan School of Management, November 2001

IT Architecture Institute <http://www.itarchitect.co.uk/>

Information Architecture Institute <http://iainstitute.org/>

The Open Group Architecture Forum (TOGAF) http://www.opengroup.org/architecture/togaf8-doc/arch/p1/togaf_faq.htm

IT Procurement

Definition of IT procurement

"Purchasing (procurement) means a commitment to pay for products or services rendered. It includes activities variously described as acquisition, procurement, buying, sourcing, and supply management. It also includes the negotiation of framework contracts and outsourcing."

IT Purchasing: Taking Control, Wentworth Research, September 1996

Further reading and useful Web sites

Improving IT procurement, U.K. Government National Audit Office http://www.nao.org.uk/guidance/focus/0304877_pp10-11.pdf

U.S. National Purchasing Institute <http://www.nationalpurchasinginstitute.com/home/index.asp>

U.S. Institute of Supply Management (former U.S. National Purchasing Association) <http://www.ism.ws/AboutISM/index.cfm>

U.K. Association of Purchasing and Supply <http://www.ukpurchasing.co.uk/>

¹ Wentworth Research reports are available only to Gartner EXP members. Others can request a PDF version of the executive summary through their Gartner representative.

Appendix: Further information and references

Project Management

Description

In addition to the GAP Principles strong project management was viewed as an essential ingredient for success. Projects are packages of works and resources that deliver new and revised IT solutions. Project management processes and discipline ensure timescales, budgets, and specifications are kept on target.

How

Case history organizations used the following approaches when implementing project management:

- One enterprise consulted widely and evaluated several project management methods and selected the one that best matched its requirements. Then it looked for software tools to support the method. Finally, it set up a project management competency framework and provided project workers with appropriate training.
- Some firms used consultants to help them implement project management. Others recruited an experienced project manager to set up a new or revised process and train their people.
- In most enterprises, project managers were usually sent on external project management training courses.

Project management is working well in the case history organizations, as shown below:

- One firm reports that regular project reviews prevent failures because problems are caught in time for remedial action to be taken.
- At another organization:
 - The internal board reviews the most sensitive projects each week and all projects each month. The board uses a “red, yellow, or green light” gating scheme when reviewing projects.
 - Project workers are assigned from a pool and trained with a combination of industry and in-house courses.
 - Project managers chose people from the pool for new projects. A competency database helps in this selection process. Project managers are responsible not only for the work, but also for project workers.
- Some enterprises either train their people so they can gain accreditation under the Capability Maturity Model for software or insist that new employees already be accredited.
- Another project management office provides advice, training, and co-ordination and ensures compliance with the standards. The advisory role is working well, but only time will tell how well the compliance role will be received.

Why

The case history enterprises reported the following tangible and soft benefits from implementing project management:

- Budgeting for IT is no longer an issue. When a project is completed, it is subject to a benefits-realization process.
- The feedback from line IT managers and project managers has been positive. The IT leadership team has seen an improvement in project performance.
- Projects using the method are beginning to show results more quickly and are better developed and delivered.
- The lack of major problems is an indicator the process is benefiting the firm.
- Project thinking is now accepted. Project scoping and agreed requirements have improved. A project charter is signed by the customer before funds are released.
- Coordination within the business has improved because a checklist is used to ensure all interested parties are involved or consulted.

“Since the implementation of the project management methodology and the PMO, costs and timescales are largely being met.”

Frank Robben,
General Manager,
Belgian SmalS-MvM

"Cost recovery rate is phenomenal compared to before the process was applied. There is a three-fold recovery compared to cost."

Gordon Miles,
CIO, Department of
Infrastructure, State of Victoria

"Don't believe that tools themselves solve any problems. Tools are necessary, but should come in last. It's essential to move from method to process model to tools. Some people stop short before tools. That is a mistake"

Stig Johansson,
Group IT Strategist, SKF

- Projects are better planned and, therefore, make more efficient use of IT resources. Control is easier, and the results are being measured.
- Project management training has resulted in customers perceiving the IT unit as professional because they realize the project information they receive will be correct. Any glitches are identified early, and alarms are raised.

Obstacles

A variety of obstacles to adopting project management principles reflected differences in the case history organizations:

- Some people in one enterprise initially found the new method too bureaucratic. Over time, the method was refined, and now only those elements that are important and deliver value are used. Also, the software tool that was used was too complex and needed more data than was justified by the benefits. This software is being replaced.
- Another firm found that line managers appointed as project managers often let their operational priorities take precedence over their project responsibilities.

Lessons Learned

The practical lessons from the case history enterprises with respect to project management offices, project management processes, and assigning business managers as project managers are set out below:

Do

- Ensure the project management office is not too big and the project management standards are not too complex.
- Introduce project management in stages rather than with a "big bang." Implement the compliance role later, for example.
- Use only those parts of the method or software tool that are truly useful.
- Have a portfolio of projects prioritized and validated by the customer. The portfolio will help project resources to be better distributed.
- Train project workers not only in project skills, but cost accounting, so they can provide the financial data that will ensure a correct assessment takes place of cost against budget and possible overruns.
- Get others involved; create a network of influencers and successful project managers to help "sell" the value of the project management office.
- Appoint a business sponsor from the start of every project.
- Provide customers with project management education so they can participate appropriately in discussing the portfolio.
- Apply the benefits-realization process to the IT and business aspects of a project.

Don't

- Let project workers have operational responsibilities as well because day-to-day pressures will always prevail over new development work.
- Let individual project managers use their own approaches.

Appendix: Further information and references

IT Project Management

Definition of IT project management

"A project is a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or team to meet specific objectives within defined time, cost, and performance parameters as specified in the business case. It should have the following characteristics: a finite and defined lifespan; a defined and measurable business product (deliverables and/or outcomes to meet specific business objectives); a corresponding set of activities to achieve the business products; a defined amount of resources; and an organization structure, with defined responsibilities, to manage the project."

U.K. Office of Government Commerce (OGC)

Further reading and useful Web sites

E-Government for Development Success and Failure Rates of E-Government in Developing/Transition-al Countries: Overview Richard Heeks, IDPM, University of Manchester, U.K. 2003 <http://www.egov4dev.org/sfoverview.htm>

Common causes of project failure, U.K. Office of Government Commerce (OGC), 2001 http://www.ogc.gov.uk/sdtoolkit/Reference/ogc_library/bestpracticebriefings/causesprojfailure.pdf

OGC Gateway™ Reviews, U.K. Office of Government Commerce (OGC) <http://www.ogc.gov.uk/index.asp?id=377>

Project Management Maturity Model: v5, U.K. Office of Government Commerce (OGC), October 2002 http://www.ogc.gov.uk/sdtoolkit/reference/tools/PMMM_release_v5.pdf

APM Group (APMG) <http://www.programmes.org/Web/Site/AboutUs/CompanyBackground.asp>

was established in 1993 as the trading arm of the Association for Project Management and became independent in 2000. Since 1996, it has—on behalf of and in partnership with the OGC—developed and managed the accreditation of PRINCE2, Managing Successful Programmes (MSP), and the Management of Risk (MoR).

International Project Management Association <http://www.ipma.ch/asp/>

International Project Management Forum www.pmforum.org

International Project Management Institute www.pmi.org

The Standish Group (researchers into why projects fail) http://www.standishgroup.com/sample_research/PDFpages/q3-spotlight.pdf



