Enterprise Architecture and COBIT

The Open Group
October 22, 2003

www.realirm.co.za

reducing risk, adding value, driving change
Agenda

- Introduction
- Case Study
- Enterprise Architecture and IT Governance
- Conclusion
Business Orientation

In order to provide the information that the organization needs to achieve its objectives, IT resources need to be managed by a set of naturally grouped processes.

Enterprise Architecture Process Thread

**Planning & Organisation (PO)**
- Strategy and tactics for IT contribution
- Meeting Business objectives
- Appropriately planned, communicated and managed
- Proper organisation and technology infrastructure
- An Enterprise Architecture is defined
- Quality is managed

**Acquisition & Implementation (AI)**
- Realisation of IT strategy
- Solutions identified, developed, or acquired and implemented
- Solutions integrated into business process
- Change and maintenance of systems

**Delivery & Support (DS)**
- Actual delivery of required services
- Actual operations through security, including training
- Establishment of support processes
- Actual processing of data by applications

**Monitoring (M)**
- Regular assessment of all IT processes
- Compliance with and quality of controls

Introduction
Agenda

- Introduction

Case Study

- Enterprise Architecture and IT Governance

- Conclusion
South African Breweries Ltd (Case Study April 1999)

- COBIT Framework used in the development of an IT Strategy (April – June 1999)
  - For each of the 34 COBIT processes documented:
    - SAB Ltd Target Environment
    - Business Objectives
    - IT portfolio services or deliverables from the IT process,
    - The current situation, and
    - Strategy and action items needed to move from the current state to the desired state.
  - Research material from Gartner, META Group, PwC, Forrester etc.
    - Linked to COBIT IT processes
    - Impact and Timing
- Key Themes = IT Governance Objectives
IT Governance Objectives

IT Governance is defined as a system to direct and control the organisation in order to achieve its goals by adding value while balancing risk versus return over IT and its processes.

- IT is aligned with the Business, enables the Business and maximises benefits
- IT resources are used responsibly
- IT related risks are managed appropriately

Case Study
SAB plc Case Study (June – October 2000)

- SAB Global IT Strategy (June – October 2000) Used COBIT Extensively:
  - Assess IT process capability maturity (actual and desired) for South Africa, Africa and Europe IT departments
  - Identify the steps or actions required to improve IT process capability maturity
  - Identify and understand areas of knowledge sharing across the group
  - Facilitate IT organisational design
  - Defining IT services from CobiT IT process
  - Identify the “key headlines” or what we need to focus on in order to support the business achieve desired capabilities
Control over the IT process *Determine Technological Direction* with the business goal of *taking advantage of available and emerging technology to drive and make possible the business strategy*.

Ensures delivery of information to the business that addresses the required Information Criteria and is measured by Key Goal Indicators.

Is enabled by *creation and maintenance of a technological infrastructure plan that sets and manages clear and realistic expectations of what technology can offer in terms of products, services and delivery mechanisms*.

Considers Critical Success Factors that leverage specific IT Resources and is measured by Key Performance Indicators.

**Critical Success Factors**

- Business technology reports are disseminated to business units
- Technology changes are pro-actively monitored for threats and opportunities, with clearly assigned responsibilities and with a defined process that uses proven and reliable resources
- Monitoring results are evaluated at senior management levels and actions are agreed upon and integrated into the IT infrastructure plan, while maintaining alignment with the IT strategic plan
- A research, prototyping and testing facility is set up focusing on demonstrating business value and on identifying constraints and opportunities, rather than technological proficiency

**Information Criteria**

<table>
<thead>
<tr>
<th>Information Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>P effectiveness</td>
</tr>
<tr>
<td>S efficiency</td>
</tr>
<tr>
<td>confidentiality</td>
</tr>
<tr>
<td>integrity</td>
</tr>
<tr>
<td>availability</td>
</tr>
<tr>
<td>compliance</td>
</tr>
<tr>
<td>reliability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>people</td>
</tr>
<tr>
<td>applications</td>
</tr>
<tr>
<td>technology</td>
</tr>
<tr>
<td>facilities</td>
</tr>
<tr>
<td>data</td>
</tr>
</tbody>
</table>

**Key Goal Indicators**

- Number of technology solutions that are not aligned with the business strategy
- Percent of non-compliant technology projects planned
- Number of non-compatible technologies and platforms
- Decreased number of technology platforms to maintain
- Reduced applications deployment effort and time-to-market
- Increased interoperability between applications

**Key Performance Indicators**

- Percent of IT budget assigned to IT infrastructure and research
- Number of months since the last upgrade

**ConiT Family of Products**

- EXECUTIVE SUMMARY
- SCOPING TOOL SET
- MANAGEMENT CONSIDERATIONS
- CREATED CONTROL GUIDELINES
- AUDIT GUIDELINES
- EXECUTION TOOL SET
- KEY PERFORMANCE INDICATORS
Determine Technological Direction (PO3)

Business Objective
To take advantage of available and emerging technology to drive and make possible the business strategy.

Target Environment
Create and maintain a technological infrastructure plan that sets and manages clear and realistic expectations of what technology can offer in terms of products, services and delivery mechanisms.

<table>
<thead>
<tr>
<th>IT Service Component</th>
<th>Process Commonality</th>
<th>Opportunities for sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology roadmap</td>
<td></td>
<td>Existing IT Standards</td>
</tr>
<tr>
<td>Technology standards</td>
<td></td>
<td>IT laboratory</td>
</tr>
<tr>
<td>IT Infrastructure planning</td>
<td></td>
<td>Technology Blueprint</td>
</tr>
<tr>
<td>R&amp;D Services</td>
<td></td>
<td>IT Research</td>
</tr>
</tbody>
</table>

Case Study
PO3 Maturity Model
Control over the IT process Determine Technological Direction with the business goal of taking advantage of available and emerging technology to drive and enable business strategy.

0 Non-existent There is no awareness of the importance of technology infrastructure planning for the entity. The knowledge and expertise necessary to develop such a technology infrastructure plan does not exist. There is a lack of understanding that planning for technological change is critical to effectively allocate resources.

1 Initial/Ad Hoc Management recognises the need for technology infrastructure planning, but has not formalised either a process or plan. Technology component developments and emerging technology implementations are ad-hoc and isolated. There is a reactive and operationally focused approach to planning. Technology directions are driven by the often contradictory product evolution plans of hardware, systems software and applications software vendors. Communication of the potential impact of changes in technology is inconsistent.

2 Repeatable but Intuitive There is implicit understanding of the need for and importance of technology planning. This need and importance is communicated. Planning is, however, tactical and focused on generating technical solutions to technical problems, rather than on the use of technology to meet business needs. Evaluation of technological changes is left to different individuals who follow intuitive, but similar processes. There is no formal training and communication of roles and responsibilities. Common applied. The technology infrastructure direction includes an understanding on where the organisation wants to lead or lag in the use of technology, based on risks and alignment with the organisation strategy. Key vendors are selected based on the understanding of their long-term technology and product development plans, consistent with the organisation direction.

4 Managed and Measurable IT staff have the expertise and skills necessary to develop a technology infrastructure plan. There is formal and specialised training for technology research. The potential impact of changing and emerging technologies is taken into account and validated. Management can identify deviations from the plan and anticipate changes. Responsibility for the development and implementation of the technology infrastructure plan has been internalised and ongoing. Internal best practices have been institutionalised and adopted as a process. The human resources strategy is linked to the technology direction, to ensure they are capable, qualified and managing technology changes. Migration and introducing new technologies are defined, owned and partnering are being leveraged to enhance expertise and skills.

5 Optimised A research function exists to review emerging and evolving technologies and benchmark the organisation against industry norms. The direction is guided by industry and international standards and developments, rather than driven by technology vendors. The potential business impact of technological change is reviewed at senior management levels and the decisions to act reflect the contribution of human and technological influences on information solutions. There is formal...
Determine Technological Direction (PO3)

Capability Maturity

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Basic (Initial)</td>
<td>Developing (Repeatable)</td>
<td>Established (Defined)</td>
</tr>
<tr>
<td>“As-Is”</td>
<td>Desired “To-Be”</td>
<td>Sophisticated (Managed)</td>
</tr>
<tr>
<td>Reactive and operationally focused approach to planning.</td>
<td>Roadmaps and migration strategies exist to take XYZ from the current state to the future state of IT infrastructure.</td>
<td>Develop an Enterprise Architecture Capability that integrates the Business, Information (Data), Application and Technology architectures, and reviews adherence to approved architectures</td>
</tr>
<tr>
<td>Future decisions are based on current investment and not on strategic direction</td>
<td>Technology Forum and Steering Committee approval of new and changed technological directions.</td>
<td>Implement an IT research, prototyping and testing facility.</td>
</tr>
<tr>
<td>Individual technology bias and mindset</td>
<td>A research function reviews emerging and evolving technologies and benchmarks XYZ against industry norms. They demonstrate business value and focus on identifying constraints and opportunities.</td>
<td>Partner with key vendors based on the understanding of their long-term technology and product development plans, consistent with XYZ direction.</td>
</tr>
<tr>
<td>Technology directions are driven by the often-contradictory product evolution plans of hardware, systems software and applications software vendors.</td>
<td>Governance mechanisms review to ensure adherence to approved architectures</td>
<td></td>
</tr>
</tbody>
</table>
IT Risk and Maturity Assessment

Domain: Planning and Organisation

Process: Determine Technological Direction

Is there a technological infrastructure plan?

Technological Infrastructure Planning
The IT function should create and regularly update a technological infrastructure plan which is in accordance with the IT long- and short-range plans. Such a plan should encompass aspects such as systems architecture, technological direction and migration strategies.

To what extent are the future trends and regulations monitored?

Case Study
SAB plc Case Study (June – October 2000)


- CobiT 3rd edition provides a global performance improvement framework
  - Identifying and focusing on key determinants of IT performance;
  - Establishing common key performance indicators across the group to enable internal and external benchmarking comparisons;
  - Providing template business processes supported by systems to enable rapid transfer of good practice, and
  - Supporting less people-intensive and more consistent ways of sharing knowledge, by encapsulating the best thinking into the process models and supporting documentation.

- Enterprise Architecture is a strategic imperative
Agenda

- Introduction
- Case Study
- Enterprise Architecture and IT Governance
- Conclusion
Enterprise Architecture is a Strategic Imperative

Enterprise Architecture is required to transform a legacy of fragmented applications, organizational structures and processes (both manual and automated) into an integrated environment with optimised processes that are responsive to change and the delivery of the business strategy.
Enterprise Architecture

- Consists of current and future state models
- Is implemented through the Enterprise:
  - Business architecture,
  - Information architecture,
  - Data Architecture,
  - Applications portfolio, and
  - Enterprise-wide technical architecture
- Provides organizations with the ability to conduct impact assessments, analyze alternative scenarios and implement appropriate strategies
- (Re-)Defines the business design for sustainable competitive advantage

Knowledge

- Business Architecture
- Information Architecture
- Data Architecture
- Applications Architecture
- Technology Architecture

Enterprise Architecture and IT Governance

- Principles
- Inventory
- Models
- Standards
Enterprise Architecture Capability

Illustartive Knowledge Frameworks

- Energy Sector
- Eskom
- Distribution
- Product Application
- Other
- Intellectual Capital

Architecture

- Business Architecture
- Information Architecture
- Data Architecture
- Applications Architecture
- Technology Architecture

Products and Services

- People
- Content
- Processes
- Tools

Enterprise Architecture Capability
EA Capability and Control Points

The Enterprise Architecture control-points are defined and managed across all applicable IT processes, resources and information criteria.
IT Services Summarized by Domain and Commonality

<table>
<thead>
<tr>
<th>Planning &amp; Organization (PO)</th>
<th>Acquisition &amp; Implementation (AI)</th>
<th>Delivery &amp; Support (DS)</th>
<th>Monitoring (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Planning</td>
<td>PO1, PO1, PO4, PO4</td>
<td>AI1, AI1, AI1, AI6</td>
<td></td>
</tr>
<tr>
<td>Enterprise Architecture Management</td>
<td>PO2</td>
<td>DS9, DS9, DS11</td>
<td></td>
</tr>
<tr>
<td>Other …</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Management</td>
<td>PO6, PO6, PO6</td>
<td>DS6, DS6</td>
<td></td>
</tr>
<tr>
<td>Other …</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Delivery</td>
<td>AI1, AI1, AI2, AI4 - 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations Management</td>
<td>AI3, AI3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Illustrative

Enterprise Architecture and IT Governance
Process Commonality

The framework provides a matrix approach to allocating responsibility for the IT services, supports global collaboration and facilitates local innovation.

The level of consolidation defines the number of physical or logical locations that an IT process is executed.

E.g. A group of countries i.e. Americas

A consolidated global process (e.g. Custodian of group IT standards and procedures)

A globally consistent process executed at the local Business Unit “Business in a box”

The level of consistency defines the extent of adherence to common principles, guidelines, and standards & procedures.

Enterprise Architecture and IT Governance
Enterprise Architecture Control Point Focus

Primary Focus

PO2 Define the information architecture
- Data Standards and Common Data Definitions PO2
- Enterprise Data Modeling PO2
- Enterprise Process Modeling PO2
- Applications Architecture PO2

PO3 Determine the technological direction
- Identify and Evaluate Emerging Technologies PO3
- Develop and Manage Technical Architectures PO3
- Identify Technical Standards PO3
- Define Application Portfolio Direction AI1

AI1 Identify solutions

Other ...

Secondary Focus

AI6 Manage changes
- Systems Selection AI1
- Systems Selection AI1
- Define Application Portfolio Direction AI1
- Change Management Procedures AI6
- Change Assessment AI6

DS9 Manage the configuration
- Configuration Management DS9
- Middleware and Integration DS9

DS11 Manage data
- Data / Content Management DS11

Other ...

Illustrative

Enterprise Architecture and IT Governance
Enterprise Architecture Management

**Purpose**
Transform a legacy of fragmented applications, organizational structures and processes (both manual and automated) into an integrated environment with optimized processes that are responsive to change and the delivery of the business strategy.

**Primary Focus**
- Optimize the organization of information systems.
- Take advantage of available and emerging technology to drive and make possible the business strategy.
- Other…

**Goal and Performance Indicators**
- Faster application development.
- Reduction of data redundancy.
- Increased operability between systems and applications.
- Decrease number of non-compatible technologies and platforms.
- Reuse of models.

**Critical Success Factors**
- A high level, corporate Enterprise Architecture function is established, with sufficient authority to administer the enterprise models, principles, and standards
- An automated repository is used to ensure consistency between the components of the Enterprise Architecture
- Roadmaps and strategies exist to take the organization from the current state to the future state of IT infrastructure and applications portfolio.
- Other…
Enterprise Architecture Management

**Corporate Focus:** Facilitate the definition of guiding IT principles, guidelines, standards and procedures for the Enterprise Architecture process. Monitor and measure progress against strategies, plans and delivery of business value.

**Global Focus:** Develop enterprise architectures for Business, Data, Applications and Technology. Produce global roadmaps and strategies to take the organization from the current state to the future state of IT infrastructure and applications portfolio (simplify through standardization). Define the Enterprise Architecture control points within operational work practices for Change Control, Configuration Management and Data Resource Management.

**Regional Focus:** Definition of Regional application and technology roadmaps in accordance with the Global direction. Implement global enterprise architecture, middleware and integration polices, standards and procedures.

**Local Focus:** Local business units assist in the assignment subject matter experts who are tasked to produce key enterprise architecture deliverables such as data definitions, business rules and business process models. Ensure that detailed operational work practices for Change Control, Configuration Management and Data Resource Management are followed and satisfy the performance requirements of the Enterprise Architecture Management process.

<table>
<thead>
<tr>
<th></th>
<th>Corporate</th>
<th>Global (Workgroup)</th>
<th>Regional</th>
<th>Local</th>
<th>Opportunities for sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles</td>
<td>A</td>
<td>R</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Guidelines</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Standards and Procedures</td>
<td>-</td>
<td>A</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>I</td>
<td>C</td>
<td>R</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Contribute Resources</td>
<td>A</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

R – Responsible
A – Accountable
C – Consult
I – Inform

Illustrative
6. **MANAGE CHANGES**

6.1 **Change Request Initiation and Control**

**CONTROL OBJECTIVE**

IT management should ensure that all requests for changes, system maintenance and supplier maintenance are standardised and are subject to formal change management procedures. Changes should be categorised and prioritised and specific procedures should be in place to handle urgent matters. Change requesters should be kept informed about the status of their request.

6.2 **Impact Assessment**

**CONTROL OBJECTIVE**

A procedure should be in place to ensure that all requests for change are assessed in a structured way for all possible impacts on the operational system and its functionality.

6.3 **Control of Changes**

**CONTROL OBJECTIVE**

IT management should ensure that change management and software control and distribution are properly integrated with a comprehensive configuration management system. The system used to monitor changes to application systems should be automated to support the recording and tracking of changes made to large, complex information systems.

6.5 **Documentation and Procedures**

**CONTROL OBJECTIVE**

The change process should ensure that whenever system changes are implemented, the associated documentation and procedures are updated accordingly.

6.6 **Authorised Maintenance**

**CONTROL OBJECTIVE**

IT management should ensure maintenance personnel have specific assignments and that their work is properly monitored. In addition, their system access rights should be controlled to avoid risks of unauthorised access to automated systems.

6.7 **Software Release Policy**

**CONTROL OBJECTIVE**

IT management should ensure that the release of software is governed by formal procedures ensuring sign-off, packaging, regression testing, handover, etc.

6.8 **Distribution of Software**

**CONTROL OBJECTIVE**

Specific internal control measures should be established to ensure distribution of the correct software element to the right place, with integrity, and in a timely manner with adequate audit trails.
Agenda

- Introduction
- Case Study
- Enterprise Architecture and IT Governance

Conclusion
Enterprise Architecture is a Strategic Imperative

Enterprise Architecture is required to transform a legacy of fragmented applications, organizational structures and processes (both manual and automated) into an integrated environment with optimised processes that are responsive to change and the delivery of the business strategy.

Conclusion
Contact Details

Stuart Macgregor
+27 (0) 11 805 3316 (office)
+27 (0) 11 805 7110 (fax)
+27 (0) 83 407 2748 (mobile)
stuart.macgregor@realirm.co.za

Real IRM Solutions (Pty) Ltd
Registration number: 2001/026036/07