

# The Open Group Architecture Principles

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*A Case Study prepared by:*

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on behalf of:

The Open Group Internal Architecture Board

October 2008

## *The Open Group Architecture Principles*

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The Open Group Architecture Principles

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## **Executive Summary**

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This Case Study defines the set of architecture principles that The Open Group Internal Architecture Board developed in undertaking its enterprise architecture.

The purpose of this Case Study is to provide an example to the TOGAF™ community of this part of the Preliminary phase of TOGAF development. It is an example of how one enterprise – The Open Group – has used them, and broadly covers:

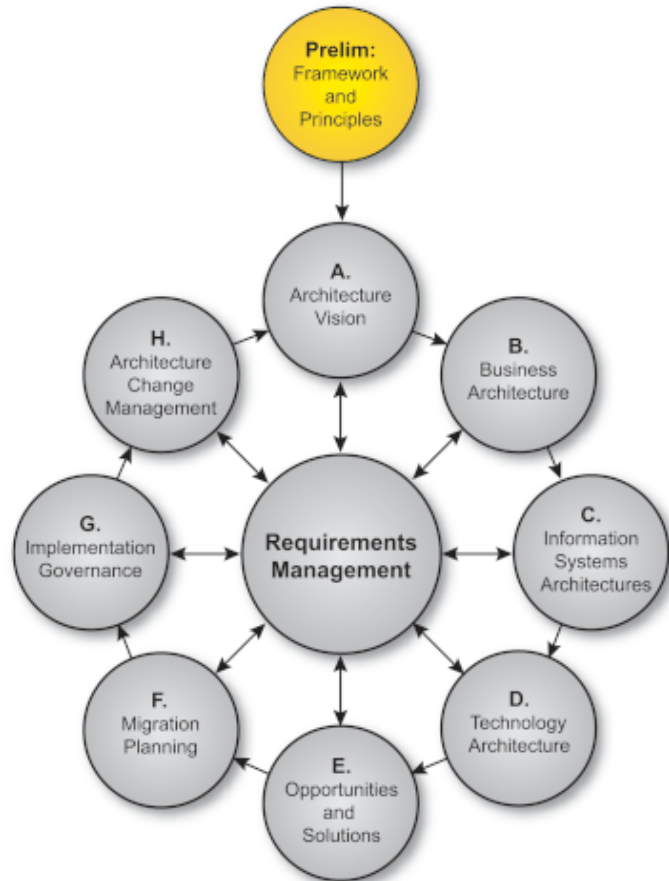
- How did The Open Group develop the principles?
- How did The Open Group apply the principles?
- How did The Open Group comply with the principles?

The Open Group would like to acknowledge Sasol Synfuels Information Management Principles of Enterprise Architecture, which was used to embellish the set of architecture principles developed by The Open Group Internal Architecture Board.

### Introduction

Broadly speaking, The Open Group used the following three key stages to develop its architecture principles, apply them throughout the enterprise and organization, and then live by them:

- **Develop:** Here, The Open Group developed an initial set of architecture principles in the Preliminary Phase of TOGAF using a standard way of documenting the principles. The principles were revised and refined during the early phases of the TOGAF ADM. Use was made of any available best practice during the development of the principles. Having stabilized the principles, they were placed under change control and applied throughout the organization.
- **Apply:** Having developed the architecture principles, The Open Group referenced them and embraced them within the enterprise during the migration from the baseline to the target architecture.
- **Comply:** At times a decision was required as to how The Open Group complied with the principles and, maybe, how changes had to be made to comply with the principles. How did The Open Group govern this?



### **Develop**

The TOGAF ADM makes the step of establishing architecture principles fairly straightforward. The principles are defined as part of the Preliminary Phase. At this definition stage, the principles are approved and agreed from a governance perspective, and used to guide and direct the organization on all future architectural decisions. The principles need to evolve with the direction and goals of the enterprise, and there is an opportunity to revise and refine them during the early stages of the ADM – Phase A (Architecture Vision) and Phase B (Business Architecture). There is opportunity here to accommodate changes and, to this end, a change control process needs to be established for adding, removing, or altering principles after their initial agreement in the Preliminary Phase.

In the case of The Open Group, once these principles had stabilized they were locked down under architecture change control, and then formed part of the requirements and constraints placed on any architecture work undertaken in The Open Group enterprise architecture. That is, these principles were applied throughout the enterprise and overrode all other considerations when architecture decisions were made. In fact, in the TOGAF Requirements Management phase, any requirements pertaining to these principles were not replicated. The principles were treated as a primary set of requirements.

Ultimately, the architectural review process (part of the TOGAF ADM) needs to ensure that projects meet and align with the principles.

The architecture principles documented in this Case Study were formulated by a cross-functional team of senior management, business analysts, architects, and senior developers formed as The Open Group Internal Architecture Board.

The Open Group based its principles on a number of sources:

- **Business Principles:** While the formation of business principles lies outside the creation of architectural principles, TOGAF suggests that it is good to have the architectural principles reinforce business principles.
- **Enterprise Strategic Goals:** The mission, objectives, and goals of the enterprise initiative. Goals such as:
  - Decrease IT costs
  - Improve effectiveness of business operations
  - Maintain the security and confidentiality of information
- **Enterprise Strategic Drivers:** The key business drivers constraining the enterprise initiative:
  - Develop an effective eco-system around The Open Group's skills standards
  - Replace obsolete systems
  - Remove stovepipes
- **Pain Points:** The pain points derived during the scenario work of Phase A and Phase B are used to revise the principles.
- **Best Practice:** Best practice documentation was studied for principles used elsewhere where they were equally applicable to The Open Group enterprise. Why re-invent the wheel?!

## ***The Open Group Architecture Principles***

### **Standard Template**

Architectural principles need to cover the full range of the architectural spectrum. TOGAF states that there are four such areas:

1. Business Architecture
2. Data Architecture
3. Application Architecture
4. Technology Architecture

In addition to these, The Open Group derived a set of governance principles.

It is useful to have a standard way of defining principles. In addition to a definition statement, each principle should have an associated rationale and implications statements, both to promote understanding and acceptance of the principles themselves, and to support the use of the principles in explaining and justifying why specific decisions are made. The Open Group used this standard approach:

<b>Name</b>	Should both represent the essence of the rule, as well as be easy to remember.
<b>Statement</b>	Should succinctly and unambiguously communicate the fundamental rule.
<b>Rationale</b>	Should highlight the value to the enterprise and, therefore, provide a basis for justifying architecture activities.
<b>Implications</b>	Should provide an outline of the key tasks, resources, and potential costs to the enterprise of following the principle. Should also provide valuable inputs to future transition initiative and planning activities.

### **Apply**

Having developed the architecture principles, how did they help The Open Group? How did The Open Group reference them and embrace them during the migration from its baseline to target architecture?

The Open Group applied its architecture principles in a number of different ways, which could be repeatable in other entities:

1. **To disseminate to staff:** Each principle is easy to understand by all individuals in the organization. The intention of the principle is clear and unambiguous, so that violations, whether intentional or not, are minimized. The number of principles needs to be considered; too many principles can reduce the flexibility of the architecture, and make the dissemination and application of the principles unnecessarily onerous. The recommended number is between 10 and 20.
2. **To provide a framework for enterprise architecture decision-making:** The principles enable good quality decisions about architectures and plans to be made, and enforceable policies and standards to be created. Each principle is sufficiently definitive and precise to support consistent decision-making in complex, potentially controversial situations.
3. **To establish relevant evaluation criteria:** This allows strong influence to be exerted on the opportunities and selection of solutions in the later stages of the TOGAF ADM.
4. **As drivers for defining the functional requirements of the architecture:** In the TOGAF Requirements Management phase, any requirements pertaining to these principles are not replicated. These principles are treated as a primary set of requirements and constraints.
5. **To assess the endurance of existing technologies and systems in the future architecture:** This facilitates informed decisions on which policies, processes, technologies, and systems need to be made obsolete, replaced, or modified as the organization moves to the target enterprise.
6. **To support the architecture governance processes and change management:** The principles were used as primary requirements when formulating the architecture change management and governance processes. They were also adhered to when issuing any policy statements.



## **Comply**

At times, a decision was required as to how The Open Group complied with the principles and how changes had to be made to comply with the principles.

The issue of architecture governance is closely linked to that of architecture principles. The body responsible for governance will also normally be responsible for approving the architecture principles, and for resolving architecture issues. This will normally be one of the principles cited.

Strict adherence to one principle may require a loose interpretation of another principle. The set of principles must be expressed in a way that allows a balance of interpretations. Principles should not be contradictory to the point where adhering to one principle would violate the spirit of another. Every word in a principle statement should be carefully chosen to allow consistent, yet flexible, interpretation. It is important to be able to decide which principles will take precedence on a particular issue.

Every potentially important principle governing the management of information and technology for the organization is defined. The principles cover every situation perceived.

Appropriate policies and procedures must be developed to support the governance of the principles.

## The Open Group Architecture Principles

The tables in the following sections document the architecture principles use by The Open Group, arranged in five principal areas:

- Business Principles
- Data Principles
- Application Principles
- Technology Principles
- Governance Principles

### Business Principles

<b>Name</b>	<b>Primacy of Principles</b>
<b>Statement</b>	Principles apply throughout the enterprise and override all other considerations when decisions are made.
<b>Rationale</b>	The only way a recognized, consistent, and measurable level of operations can be provided is if all parts of the enterprise abide by the principles when making decisions.
<b>Implications</b>	<ul style="list-style-type: none"><li>• Without this principle, short-term consideration, supposedly convenient exceptions, and inconsistencies would rapidly undermine the management of information.</li><li>• Information management initiatives will not be permitted to begin until they are examined for compliance with the principles.</li><li>• A conflict with a principle will be resolved by changing the conflicting initiative, which could delay or prevent the initiative.</li></ul>

<b>Name</b>	<b>Maximize Benefit to the Enterprise</b>
<b>Statement</b>	Information management decisions are made to provide maximum benefit to the enterprise as a whole.
<b>Rationale</b>	This principle embodies “service above self”. Decisions made from an enterprise-wide perspective have greater long-term value than decisions made from any particular organizational perspective. Maximum return on investment requires information management decisions to adhere to enterprise-wide drivers and priorities. No minority group will detract from the benefit of the whole. However, this principle will not preclude any minority group from getting its job done.

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<b>Implications</b>	<ul style="list-style-type: none"> <li>• Achieving maximum enterprise-wide benefit will require changes in the way information is planned and managed. Technology alone will not bring about this change.</li> <li>• Some organizations may have to concede their own preferences for the greater benefit of the entire enterprise.</li> <li>• Application development priorities must be established <i>by</i> the entire enterprise <i>for</i> the entire enterprise.</li> <li>• Applications components should be shared across organizational boundaries.</li> <li>• Information management initiatives should be conducted in accordance with the enterprise plan. Individual organizations should pursue information management initiatives that conform to the blueprints and priorities established by the enterprise. The plan will be changed as needs arise.</li> <li>• As needs arise, priorities must be adjusted. A forum with comprehensive enterprise representation should make these decisions.</li> </ul>
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<b>Name</b>	<b>Compliance with Law</b>
<b>Statement</b>	Enterprise information management processes comply with all relevant laws, policies, and regulations.
<b>Rationale</b>	Enterprise policy is to abide by laws, policies, and regulations. This will not preclude business process improvements that lead to changes in policies and regulations.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• The enterprise must be mindful to comply with laws, regulations, and external policies regarding the collection, retention, and management of data.</li> <li>• Education and access to the rules. Efficiency, need, and common sense are not the only drivers. Changes in the law and changes in regulations may drive changes in processes or applications.</li> </ul>

<b>Name</b>	<b>Available Anytime from Anywhere</b>
<b>Statement</b>	Access must be available to those entitled to it, in real time, regardless of where they are or what time it is.
<b>Rationale</b>	Support staff need to be able to support the system remotely at any time of the day or night. Staff should be able to obtain or update information on-demand. Customers should be able to access information to which they are entitled from wherever they are at anytime.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Usage of the system will be improved and thereby use of other data sources discouraged.</li> <li>• There is a requirement to synchronize between corporate and personal systems/devices.</li> </ul>

<b>Name</b>	<b>Business Continuity</b>
<b>Statement</b>	Enterprise-critical systems (e.g., contractual commitments, conference registration, web, and email) need to be available to an acceptable level of service.
<b>Rationale</b>	Credibility as a global organization depends upon perceived 24x7 operations.

## The Open Group Architecture Principles

<b>Implications</b>	<ul style="list-style-type: none"> <li>• Dependability is a key feature of both the applications and the underlying infrastructure on which they rely.</li> <li>• Protection is critical against denial of service attacks, viruses, and other malicious activities that have the potential to disrupt availability.</li> <li>• Need to define an acceptable level of service.</li> <li>• Access to support 24x7, if needed, is critical.</li> </ul>
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<b>Name</b>	<b>Citizenship</b>
<b>Statement</b>	The Open Group will not provide a base from which those with malicious intent can launch attacks on others.
<b>Rationale</b>	As hackers become more skilled and have access to new, more powerful tools, so there is increased risk that they may use The Open Group's infrastructure as a base for launching denial of service attacks on others, or to send inappropriate or offensive material. It is critical that The Open Group's good reputation is not tarnished by being identified as a source of such activity.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Need to protect the core infrastructure, mobile users, and devices.</li> <li>• Need effective detection of attack, response, and recovery.</li> </ul>

<b>Name</b>	<b>De-Customization</b>
<b>Statement</b>	Having established the requirements and found the solution of best fit, The Open Group will amend the requirements rather than require custom amendments to the solution.
<b>Rationale</b>	The Open Group is not unique in many of its business processes, and industry solutions have been invented to address them. Customization incurs cost and causes problems of support as well as potentially opening up additional security risks.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Cost, security, business continuity.</li> <li>• The business process driving the requirement will be modified to fit the solution.</li> </ul>

<b>Name</b>	<b>Painless User Experience</b>
<b>Statement</b>	The user (customer, staff, and others entitled to use the system) experience needs to consume no more time or difficulty than they would experience in current commercially accessible systems.
<b>Rationale</b>	Customers can be lost, users frustrated, or time wasted by collecting unnecessary information or by complexity in the system. On the other hand, valuable and appropriate business information could be legitimately collected without being excessive as compared with other organizations.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Need to be aware of appropriate exchange of value.</li> <li>• Need to validate information collected.</li> <li>• Need to guide user through the process easily.</li> </ul>

<b>Name</b>	<b>Self-Service</b>
<b>Statement</b>	Customers should be able to serve themselves.
<b>Rationale</b>	This will improve customer satisfaction, reduce administrative overhead, and potentially improve revenue.

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<b>Implications</b>	Need to improve ease-of-use and minimize training needs. For example, members should be able to update their contact details, etc. and buy additional membership products online.
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<b>Name</b>	<b>Sharing of Information</b>
<b>Statement</b>	The Open Group will facilitate sharing and use of knowledge throughout the company.
<b>Rationale</b>	There are often new or infrequent tasks to perform where the user does not possess the immediate knowledge necessary to do the job. Also resources are limited, so each user has to do more than one thing.
<b>Implications</b>	Need to consider how to share information.

### Data Principles

<b>Name</b>	<b>One Source</b>
<b>Statement</b>	The Open Group information system should have one source for each type of data held.
<b>Rationale</b>	If there are multiple sources of data of a type, more time is often consumed in reconciling the two than in ensuring its efficient collection. For example, if the Membership Database contains a list of members and the Finance System another set, then these are invariably at odds and significant time is wasted establishing which is correct.
<b>Implications</b>	While multiple copies of the data may be in existence, the re-keying of the same data will be discouraged. This extends to textual information that should be entered once, but may be used in many different environments.

<b>Name</b>	<b>Content Management</b>
<b>Statement</b>	The Open Group web site content should be managed by a system that enables a variety of technical and non-technical staff to create, edit, manage, and finally publish a variety of content, in line with corporate policies and processes that ensure a coherent, consistent web site appearance.
<b>Rationale</b>	The web site user should have a positive experience with access to fresh, relevant, high quality information. The user should be encouraged to revisit the site. A dynamic, up-to-date web site creates the image of a forward-thinking company. Decentralized content creation removes dependency on the webmaster/web team (in line with the De-Skill principle).
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Giving a larger number of staff the authority to alter the web site (public face of the company) must be managed carefully.</li> <li>• An expensive, complex content management system may be required.</li> </ul>

<b>Name</b>	<b>Custodianship</b>
<b>Statement</b>	Personal, private, or sensitive information will not be disclosed improperly.

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<b>Rationale</b>	<p>The Open Group is the custodian of personal, private and sensitive information, employment details, health information, and even technical information that may not be disclosed to others or shared with persons of different nationalities, including between staff of The Open Group.</p> <p>In certain parts of the world there are legal rules that have to be met with regard to privacy, but which have to be treated as a minimum standard for worldwide operations. Care must be taken that this is not only active, but also passive (accidental).</p>
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Business reputation, credibility, and continuity are critically dependent upon preserving this principle.</li> <li>• Likely to mean adopting the most onerous legal standard (within reason; e.g., US/EU). N.B. Legal requirements are the minimum standard upon which we build our own ethical standards.</li> </ul>

### Application Principles

<b>Name</b>	<b>De-Skill</b>
<b>Statement</b>	The Open Group will establish systems and processes to ensure that there is minimal dependency on skill sets and job functions.
<b>Rationale</b>	The skills and specialist knowledge required to administer systems and operations should be minimized. This will help to reduce dependency on specific staff members.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• Some processes may have to be simplified.</li> <li>• May lose some benefits of having more complex, specialized systems.</li> </ul>

<b>Name</b>	<b>Re-Use, not Re-Invent</b>
<b>Statement</b>	Re-use before buying before building.
<b>Rationale</b>	To save time and effort and hence cost. If items can be re-used instead of being procured or created from scratch, this will cut down time, and therefore cost.
<b>Implications</b>	<ul style="list-style-type: none"> <li>• A repository of re-usable components will have to be set up and cataloged.</li> <li>• Design scalable and modular re-usable components.</li> <li>• Develop a culture of re-use.</li> <li>• "As-is" must be clearly defined and documented.</li> </ul>

### Technology Principles

<b>Name</b>	<b>Boundaryless Information Flow</b>
<b>Statement</b>	The technical architecture modeling should follow The Open Group vision of Boundaryless Information Flow.
<b>Rationale</b>	The Open Group promotes the concept of Boundaryless Information Flow, so it should strive to eliminate stovepipes by promoting an architecture which allows the sharing of data across systems.
<b>Implications</b>	All systems should be capable of exposing common interfaces to allow data to be shared across systems. Where systems do not follow the standard SOA approach, then it may require "broker" applications to interface with the Information Provider and Information Consumer Applications. This will particularly be true for legacy systems or COTS-based solutions.

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### Governance Principles

Name	Standardization
Statement	Throughout The Open Group there is a standard for each use of IT. Specific authorization is required to acquire non-standard items, regardless of cost.
Rationale	The cost of support and staff training is significantly reduced via standardization. It also facilitates providing staff cover during absence. Conversely, a lack of standardization can result in fragmentation of tasks, leading to a need for additional staff that would otherwise be redundant.
Implications	Authorization is required before non-standard tools, systems, software, or other IT items are purchased.

Name	Stability
Statement	In order to achieve stable systems and controlled migration paths, only approved modifications may be made to any system or application.
Rationale	Modifications to systems can have an impact on the business model of The Open Group. To make modifications without proper authorization can lead to mistakes in how the business of The Open Group operates with potentially harmful consequences. Modifications to systems often consume time which should be consumed effectively and not just in response to the latest request.
Implications	Stability means some delay in making modifications to systems, but it also means that some intended modifications may, in the end, be deemed unnecessary.

Name	Discovery
Statement	The Open Group encourages the discovery of new technologies, techniques, and approaches.
Rationale	New technologies and techniques can have a significant impact on continued cost, operational, and competitive effectiveness. The discovery of new technologies and techniques can come from anywhere in the organization and should not be the domain of a small group.
Implications	Staff should be allowed to try out new things, and a small budget should also be set aside for skunk works and pilot projects. However, before new things are used instead of approved systems and processes, they will need approval according to the Standardization and Stability principles outlined above.

Name	Separation of Development, Maintenance, and Operations
Statement	It is critical to have a working definition of the separation of development, maintenance, and operations to enable decisions to be made; e.g., the acquisition of materials.
Rationale	The appropriate type of approval for expenditure must be in place – whether that is in terms of time or money.
Implications	<ul style="list-style-type: none"> <li>• Development, which includes modifications to systems, needs architectural approval.</li> <li>• Maintenance, which does not include modifications to systems, does not need architectural approval.</li> <li>• The operation of systems does not require architectural approval.</li> </ul>

## References

- Introducing The Open Group Architecture Framework (TOGAF), Part 3: Create an Enterprise Architecture with TOGAF ([www.ibm.com/developerworks/architecture/library/ar-togaf3](http://www.ibm.com/developerworks/architecture/library/ar-togaf3)).
- TOGAF 8.1.1, Part IV: Resource Base, Architecture Principles ([www.opengroup.org/architecture/togaf8-doc/arch/chap29.html](http://www.opengroup.org/architecture/togaf8-doc/arch/chap29.html)).

## About the Authors

### **Darren Hawley**

Darren Hawley is the Director of Software Development at The Open Group. Darren is leading The Open Group Enterprise Architecture project to update The Open Group business infrastructure applications.

Since joining the company in 1999, Darren has been closely involved with all of the certification and testing development activities of The Open Group. Prior to joining The Open Group, Darren worked in the telecommunications industry, including three years in mobile communications.

Darren has 26 years' experience in hardware/software engineering and holds a BSc in Electrical and Electronic Engineering. He is a Chartered Engineer and member of the Institute of Engineering and Technology and AOGEA. Darren is TOGAF 8 certified, and is currently preparing for his ITAC and ITSC certification.

### **The Open Group Internal Architecture Board**

Past and present members of The Open Group Internal Architecture Board are as follows:

Allen Brown, President & CEO  
Steve Nunn, VP & COO  
Dave Lounsbury, VP Collaboration Services  
Andrew Josey, Director of Standards  
Graham Bird, VP Marketing  
Darren Hawley, Director of Software Development  
Andrew Crowe, Senior Developer  
Neil Moses, Senior Developer  
Andrew Thackrah, Senior Developer

## About The Open Group

The Open Group is a vendor-neutral and technology-neutral consortium, whose vision of Boundaryless Information Flow™ will enable access to integrated information within and between enterprises based on open standards and global interoperability. The Open Group works with customers, suppliers, consortia, and other standards bodies. Its role is to capture, understand, and address current and emerging requirements, establish policies, and share best practices; to facilitate interoperability, develop consensus, and evolve and integrate specifications and Open Source technologies; to offer a comprehensive set of services to enhance the operational efficiency of consortia; and to operate the industry's premier certification service, including UNIX® system certification. Further information on The Open Group can be found at [www.opengroup.org](http://www.opengroup.org).