atoll technologies

Enterprise Architecture Management

supported by SAMU, the Enterprise Architecture Modeling Tool

SAMU
System Architecture Management Utility

One look is worth a thousand words.
Get the Big Picture.

Introduction

Complexity and architecture

Complexity is one of the main issues of managing large enterprises. The challenges of heterogeneous environments, processes, complex changes and decisions can lead to failure and provide a competitive edge at the same time. The question is always whether you can adapt.

A century's accumulated engineering experience shows that an architecture-based approach is the best way to manage complexity. This is as true for management sciences as it is for engineering.

For a long time, the only area that focused on architecture planning was IT; sooner or later, practically every conversation at large enterprises' IT departments involved architecture in some form – application architecture, hardware architecture, interface architecture, etc.

> *If it gets so complex you can't remember everything all at one time, you have to write it down... ARCHITECTURE.*
>
> *Then, if you want to change it, you go to what you wrote down... ARCHITECTURE.*
>
> John A. Zachman
> Zachman International

Architecture as a concept, and the closely related issue of the heavily structured nature of systems, first appeared in management methodologies in the early '90s. Managers, responsible for projects aimed at enhancing the efficiency of business processes, started to think in terms of process models. Unification (or unified architecture), on the other hand, was not a consideration in the beginning. Every department and business unit had its own preferred views and diagrams. As strategic and operational plans required increasingly detailed data for justification, the diagrams, reports and models became more extended and difficult to decipher. It was hard to recognize the relationships between different levels of abstraction, and although each of these tools provided information about the same company, it was hardly possible to understand deeper relationships anymore.

Enterprise Architecture Management (EAM)

As business processes became increasingly dependent on IT, along with the growing risks involved in IT operations, business areas soon realized that unifying plans, models and diagrams in a single system (or architecture) was a sensible thing to do: IT and business knowledge had to converge. This is when the concept of managing Enterprise Architecture (EA) in a consolidated way was born, with the aim of organizing components into one combined system. The first comprehensive methodology was published by John A. Zachman in IBM Systems Journal, an internal IBM publication, in 1987. The article gained a lot of attention immediately.

EAM was first picked up by global companies, but the real driving force behind the spread of the methodology turned out to be the government sector. In the United States, the repeated failure of governmental software development projects lead to the Clinger-Cohen Act in 1996. The Act requires every U.S. government body to build an Enterprise Architecture. The Federal Enterprise Architecture Framework (FEAF) was designed in 1999, which later became the foundation of such specialized methodologies as the Treasury Architecture Framework (TEAF) or the Department of Defense Architecture Framework (DoDAF).

In Europe, the driving force behind the spread of EA is the Government Sector of the United Kingdom. The Ministry of Defense Architecture Framework (MoDAF), established by the UK's Ministry of Defense, and the NATO Architecture Framework (NAF), currently being developed by NATO, are the first truly successful European initiatives in this area. The Open Group Architecture Framework (TOGAF) is also becoming widely popular, thanks to its process-oriented approach, which is supported by multinational firms extensively.

The Challenges of Architecture Management

Why is Architecture Management important?

In our experience, architecture planning (or merely thinking in architecture) is still not very mature. With a few exceptions, neither large enterprises nor public administrations put enough emphasis on consciously building and applying their Enterprise Architecture.

Managers of most organizations believe to have a comprehensive picture of the operation and architecture of the area they are responsible for. When making decisions, however, the information often turns out to be insufficient or not precise enough. Other times, the available documents are too technical, too detailed or simply out of date. In these cases, fragments of information are collected from across the entire organization. A long process of negotiations begins, and experts attempt to reconcile their knowledge about corporate and IT operations in endless meetings.

A clear picture

Decision making is not the only process where accurate information is vital. We as developers have suffered from not being able to build on a “clear picture” about client environments in many of our consulting and software development projects. If basic architectural information is not available from a central and consolidated source, then the project is forced to re-assess the environment architecture – including its IT and business aspects – in the preparatory phase. As a result, most IT projects end up spending 10-15% of their budget on tasks that are not strictly relevant to the objectives, and which could be spared if the architecture was governed in a unified way.

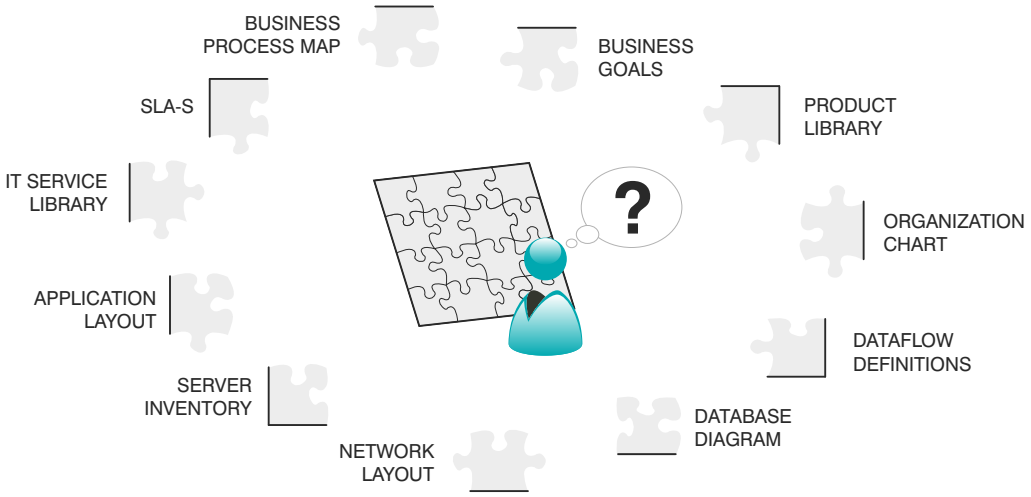

Figure 1: The synthesis of individual elements builds up the Big Picture

It is easy to think that once the architecture is described, the next project will be able to reuse the results of the first assessment, avoiding falling into the same trap again. Practice shows, however, that documentation prepared during each project mostly focuses on the actual project scope, which is a small section of the architecture – if such issues are discussed in it at all. Further components of the architecture are described only in very broad terms, if not omitted altogether. Once a project is over, the documents, diagrams and tables become gradually outdated, and soon they sink into complete oblivion. When the next project begins, the entire process starts all over again.

If an exceptional project does attempt to rely on the information gathered previously, then participants have two options after the time-consuming task of filtering out the irrelevant data: either they trust that the documents are comprehensive and up-to-date enough and risk starting their own project on false premises, or they can start verifying every piece of information individually.

Bird’s-eye view

Architecture information is not stored in a single IT system; the individual components of the architecture are scattered across the databases of inventories, remote supervision systems, monitoring or configuration management systems. These systems are optimized to support a particular IT process. In most of the cases, good and efficient decision making does not need the level of detail offered by these IT operational applications, which all focus on a very narrow slice of the problem space. Instead, what is really required by decision makers is an overview that none of these systems can offer by themselves.

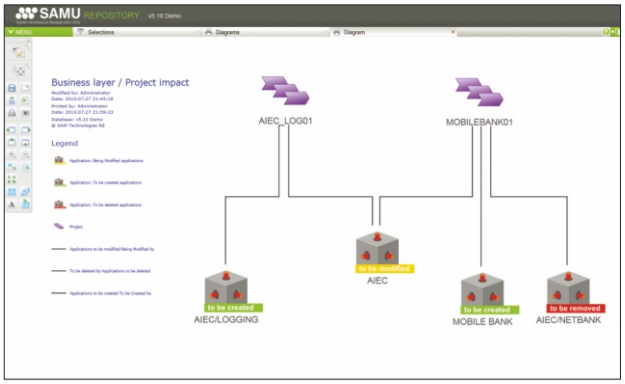

Figure 2: Concurrent projects work on the same object

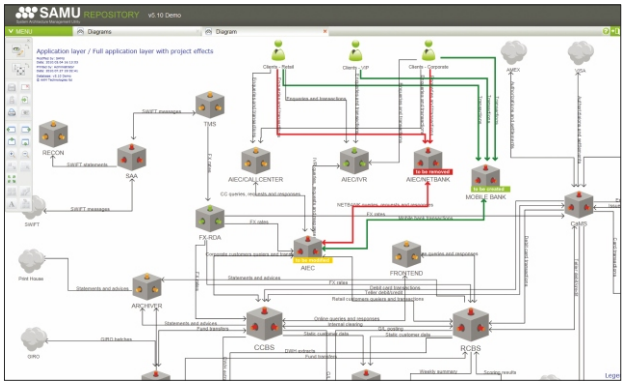

Figure 3: Application landscape with impacts of projects highlighted

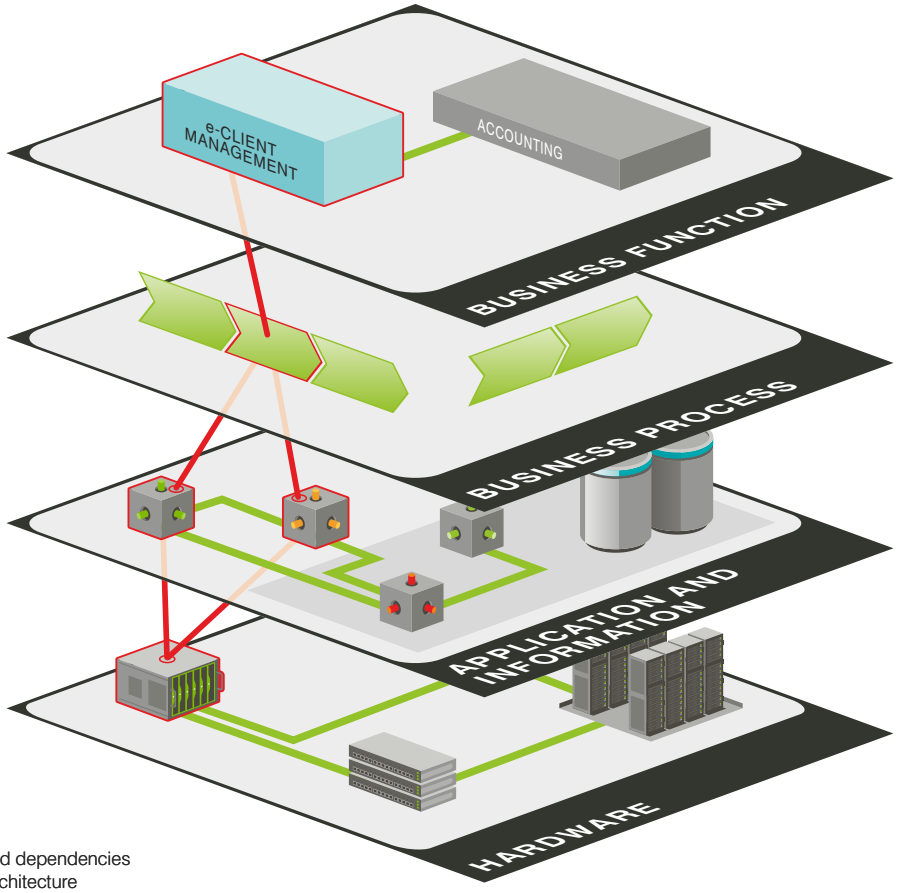

Figure 4: Relationships and dependencies span across all layers of architecture

Diverse information requirements

Although the underlying IT architecture is the same, an IT director, a business manager, a safety manager, a project leader or a project member will require different views to assist them optimally.

IT assets linked to business processes

For most decisions, knowing only the IT architecture is not sufficient. In order to make an informed decision, the person needs to know its connections to internal and external organizations, business activities, products and business processes.

Architecture governance

Enterprise architecture is a policy and rule set – complete with a reliable enterprise repository – that tells how projects can get aligned with the enterprise strategy. This means that you need to govern its accomplishment on each individual project. This is done in two ways:

- First, project initiation and scoping must be done based on the up-to-date repository and be aligned with the architectural policy set. Projects that do not comply with these rules can only be implemented if the reasons for deviation and the action plan for re-alignment with the policies are documented. No "special" projects may be left alone running in the organization, requiring money spent on something that is not serving the enterprise strategy.

- Second, running projects must be governed by the Enterprise Architecture Team, since projects tend to lose sight of their original goals, including the overall goals of the enterprise. It is the responsibility of the Enterprise Architecture Team to check if the individual projects are heading in the pre-defined direction and trigger re-assessment if necessary.

Enterprise Architecture Management is a continuous exercise. Companies need to build and refresh it with new experiences or with any changes in strategy. Just as TOGAF (The Open Group Architecture Framework) describes it: EAM is a cycle that you need to start all over again. There's always something you can fine-tune to have the policies better serve your company strategy. On the other hand, governance is also important to feed the information back from the "field" to the strategy making and regulatory organization.

Solution: SAMU the EAM toolbox

SAMU, developed by Atoll Technologies, is a set of tools for architecture modeling and management that was specifically designed to address the challenges above and beyond. SAMU enables the entire organization to gain easy access to all necessary information about business-critical components of the enterprise as well as the relationships and links between the elements. By deploying SAMU, an organization can create a unified foundation for IT and business architecture management.

The highly flexible modeling capabilities of the application and its efficient query and visualization features help each user to receive the information he/she needs in the right form and level of detail. Its unique capabilities also help to manage change processes and to keep business continuity and disaster recovery plans up-to-date.

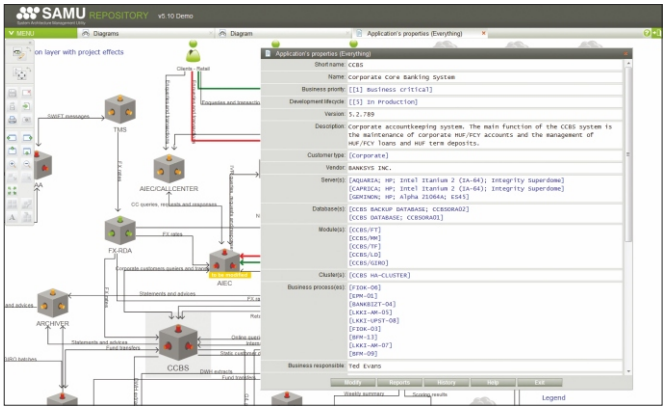

Figure 5: Everything in SAMU is an object with attributes

Unified EA Repository

SAMU was developed by Atoll Technologies with the aim of creating an application that allows organizations to manage architecture in a unified way. It stores all elements of the enterprise that are important from an architecture management point of view. Such a continuously updated repository is quickly recognized as the source of the most important architectural information across the entire organization, providing up-to-date and consistent diagrams, maps and reports.

These outputs can be used for project planning, enhancing internal communications between IT and business divisions, or even for tendering and public procurement procedures. The repository gives project participants an overview of the total architecture, or a selected portion of it, so that they are not forced to base their planning on incomplete or obsolete information. It also enables decision makers to see, understand and communicate the enterprise elements (objects, processes, resources, etc.), discover the relationships between them and target investments to where they are really required.

Modeling the organization

In order to help you, an Enterprise Architecture Management tool, including SAMU, should reflect your organization exactly. Therefore, probably the most important feature of any EAM software is its meta-modeling capability. If the application comes with out-of-the-box models every client should be using, then strict boundaries might help you at the beginning, but you'll grow beyond them very rapidly.

SAMU has been implemented in many industries for many companies and different organization models. Basically, you'll not find two identical structures due to the fact that there're no two identical enterprises either.

When creating the model tailored to your organization, you'll need to consider several things:

Choose your Architecture Framework to start with
There are so-called Enterprise Architecture Frameworks available, like TOGAF, DoDAF, Zachman, etc. None of them are magic, each being a collection of planning and governance best practices and documents, which can be used as templates when creating your own. Remember, they are not prescriptions that will automate your problem solving. These are a set of collections that can help – "rational thinking" within an enterprise, but the contribution of the creative architect remains indispensable.

Tailor it to your needs
Once you've got the industry best practices, you'll need to create your own EA policy. You could also decide to build a completely new architecture model, without originating it from an available framework. Either way, the result will only be applicable to your organization and your way of operating.

Build your repository according to your enterprise model
The model should create the repository, not the other way around! If you make too many compromises, due to the strict boundaries and limitations of the EAM tool, you'll end up implementing the software vendor's model on your repository, instead of your own.

When implementing SAMU, Atoll Technologies delivers so called "reference models", which are templates we created on the base of our experiences and EA projects. They can be flexibly fine-tuned according to your requirements; or you also have the choice to start your own model from scratch. In both cases, you'll have the full flexibility of the meta-modeling capabilities of SAMU. In essence: you'll be able to implement and maintain your individual enterprise model within SAMU at all times.

Populate the repository
The first three phases are probably the most important, since they'll formulate the basis of your EA building blocks, policies and governance operations. Populating, however, will also be quite time consuming, and altogether full of experiences and learning. It is an interviewing and documentation session that can be done in parallel in different organizations of your enterprise. In 99% of the cases, companies realize during these sessions how different the processes and communication flows are from what they thought of. Most times, these findings help pinpoint possible improvement points right from the start of the EA initiative.

Govern with EA policies and maintain the repository
Once the rules are set, you need to make sure that they're kept and built upon – remember, these rules and procedures reflect your Enterprise Strategy. Changes in the architecture objects must be maintained well, therefore the change management process forms a key element of the enterprise architecture management. SAMU is to be integrated with your existing change management processes; should you not have any in place, you can rely on the SAMU Human Workflow module, which is fully integrated with SAMU Repository.

Your Enterprise Architecture Team must also take part in individual projects for three reasons:

1. since they're respected experts of your company, who understand both technology and business terms, they can be valuable assets of the individual projects;
2. while participating, they can monitor if EA rules are kept and enforce them if necessary;
3. by being close to EA strategy making and to the individual projects at the same time, they can constantly fine-tune the EA policies to best suit your organization.

Overview and drill down

Through its modeling capabilities, SAMU can illustrate individual architectural layers and their deeper relationships in a transparent way. The user-friendly graphical interface allows business and IT users to explore the entire architecture, or only the section that is relevant to the decision at hand. The reporting engine lets you to build queries against the database on the GUI. These will collect the set of objects and relationships you defined from the repository and visualize them either on diagrams, or in textual reports. You can even build special reports like matrices.

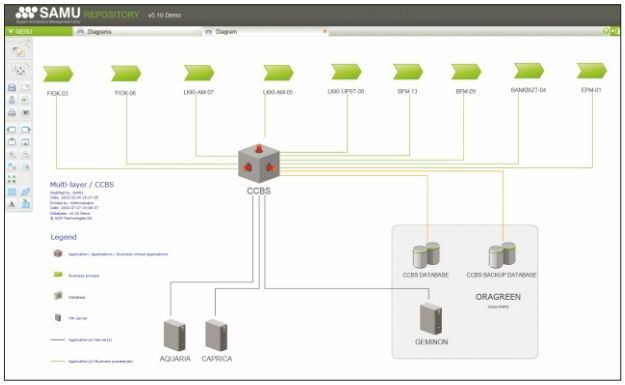

Figure 6: Multi-layer reports for impact analysis

Enhanced communication between IT and business

SAMU's flexible views and efficient query and visualization features help every user to receive the information needed in the right form and level of detail. Through SAMU's web-based interface, users can access the required reports and maps in a quick and easy manner. Enhanced communication between IT and business departments has proven to be by far the greatest advantage of a centralized enterprise repository. Evaluations, planning and decision making can be based on data provided by one central database of enterprise information in different contextual views.

Integration with change management processes

There are many ways to keep the repository continuously up-to-date. It is the most efficient when integrated with the genuine change management processes of the enterprise. For the best result, the SAMU Human Workflow module can realize your defined change processes in an electronic workflow that is integrated with SAMU Repository. It will read architecture data from the repository, obtain reports for impact analysis and update the architecture objects with the changes.

The benefits of an Enterprise Architecture practice

There are many benefits of a well-established Enterprise Architecture practice. To highlight a few:

- **Better resource allocation** — as you'll be aware of the big picture of your enterprise, you can plan and allocate your resources far better, including investments.
- **Decision making based on accurate information** — the Enterprise Repository will present an accurate picture of your overall organization. Before making decisions, you can get a view of the related segments; you'll not only see the physical and logical location of the desired outcome (application, hardware, business process, etc.), but other affected areas will be visible immediately, too.

- **Improving communication across organizations** — this is probably the most useful impact of Enterprise Architecture. Since both business and IT are using the same repository, in distinct views, they'll be talking about the same matter in business meetings. It is our experience that a joint EA repository can increase the level of communication and the level of understanding between business and IT dramatically.

- **Reducing costs by reducing duplication** — many projects run parallel with overlapping outcomes, or at other times, new projects start to deliver something that is already handled by another application. With EAM you can discover these before they are executed and stop or redirect them to deliver strategy-aligned results.

- **Reducing risks** — since you've got a better company overview, you can be aware of many hidden risk factors before making any decisions. You can also see how individual projects and the risks associated affect one another.

- **Faster developments** — new developments can be based on a set of standards, available services, frameworks and programming languages defined by the Enterprise Architecture policy. This will increase the quality of work, the visibility of the IT and information infrastructure and the value of SOA investments.

- **Harmonized business requirements and IT solutions** — due to better communication and the bird's-eye view delivered by the Enterprise Repository, business departments can create much clearer requirement specifications, which can be seen in conjunction with other business efforts. Should there be any overlap of goals, they can be restructured well before twice the costs are incurred by parallel projects. You can also build new projects on the results of another. Based on better business specifications, IT can deliver better solutions, too.

Summary of functions and Architecture

Business Functions

- Central repository of all enterprise architecture components, including tangible items like hardware equipment, buildings, rooms, along with soft elements like applications and business processes
- Register and visualize the relationships and dependencies among enterprise elements
- Integrated workflow module for effective component change management
- Generate dynamic visual maps of enterprise layers and relationships
- Enterprise information can be segmented, filtered, listed and reported on at any point of time
- Reports, graphical maps and documents generated can be published on company Intranet, project portals, etc.
- Supports the Enterprise Architecture Framework of your choice with accurate AS-IS company state map and change management workflow

Technical functions

- LDAP integration and enhanced permission management for secure operations
- Java web application with and RDBMS repository
- All management functions are performed using a graphical interface

SAMU Repository is a JAVA based web application, which stores all business and configuration information in RDBMS. It can be connected to an LDAP service or you can chose to authenticate users without a Directory.

SAMU Human Workflow is the module for change management.

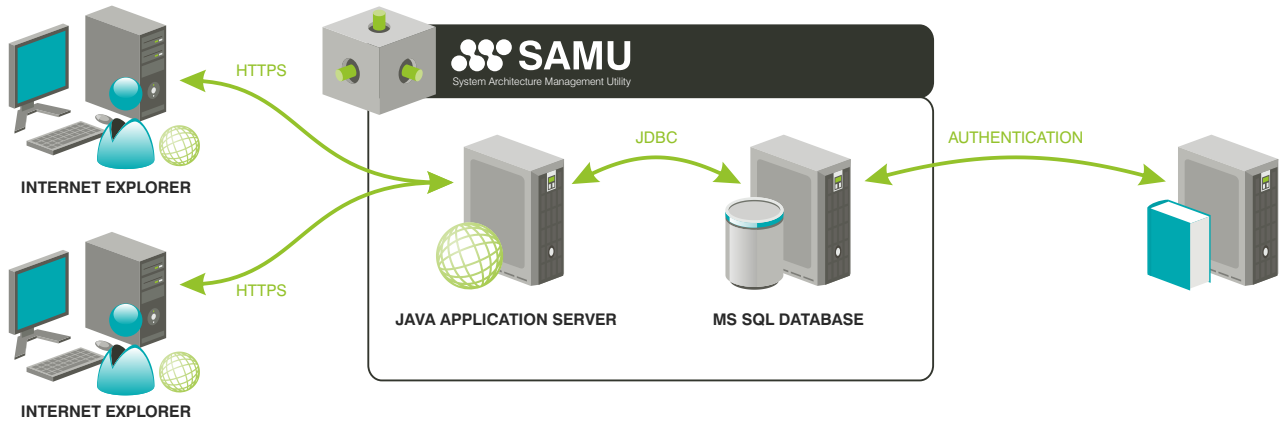

Figure 7: SAMU's architecture

Related areas

Enterprise Architecture is the policy around which you build and govern your organization. It comprises all CRM, e-Banking, ERP, Messaging or management tools. When mapping your architecture elements, you'll soon realize that your enterprise works in a way that is different than what you thought it would be. The information flows in a different manner and business processes involve more or different applications and resources than you expected. Introducing continuous Enterprise Architecture Management within your firm and governing your operations accordingly will highlight many points in your processes for improvement.

Atoll Technologies can help you in the following related fields – always keeping an eye on how the solution will fit in with your Architecture Policy:

- **Service Oriented Architecture (SOA)**

  SAMU can give you a bird's-eye view of your enterprise. With it, you'll be able to plan your SOA strategy more accurately and control fulfillment.

  Atoll Technologies has a wealth of expertise in Business and Application Integration in different areas of the enterprise. One of the most sophisticated IBM Message Broker solutions in Central and Eastern Europe has been implemented by Atoll Technologies.

- **IT Service Management (ITIL)**

  ITIL Configuration and Change Management processes should also be harmonized with Enterprise Architecture practices. While EA focuses more on strategic planning, ITIL focuses on operational issues and processes. These approaches complement each other and you'll need both if you want to increase the efficiency of your enterprise. Two important links between EA and ITIL are immediately apparent: the integration of CMDB and EA repositories and the cooperation of Architecture Board and Change Advisory Board are vital.

- **Business Continuity Planning, Disaster Recovery Planning**

  An accurate and up-to-date EA repository can dramatically decrease the time spent on creating and maintaining BC and DR plans. SAMU Repository is able to provide vital reports showing relationships and dependencies among objects from different layers of architecture.

Plan. Architect. Govern.

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