

# IT Architects and SAP – 7 ways to make this a perfect match.

*By Mendel Koerts*

**IT Architects are no longer a unique phenomenon in the SAP world. Or rather reverse that: SAP is no longer the odd one out in the world of IT Architects. To see how to best match IT Architects and SAP, we'll peek into the kitchen of the Dutch Department of Transport and Water Management. This case study will teach us 7 lessons on what works in an SAP ecosystem.**

*'Vlissingen ademt zwaar en moedeloos vannacht. De haven is verlaten, want er is nog maar één vracht.'* [1]

*<Flushing's breathing heavily and down-heartedly tonight. The harbor is deserted, 'cause there is but one last freight.>*

Dutch pop group Bløf has been singing about the coast of province Zeeland since 1999. The Zeeland delta is roughly comparable to the New Orleans area and knew its own Katrina-like catastrophe back in 1953. For ships to leave a Zeeland harbor safely is not to be taken for granted. The North Sea is a shallow one. If nature were to have its way, the shipping routes wouldn't be any deeper than around the height of a two-story house.

Navigation courses, waterways and dangerous spots all have floating markings, such as light and can buoys, as well as fixed markings, like harbor lights and lighthouses. They all ensure maritime safety, as it is called in jargon, providing a swift and safe course for shipping traffic. Maintenance of these waterway markings is but one of the Department of Transport and Water Management's many responsibilities. This duty is supported by IT

functionality provided by packaged solutions from SAP.

## **The Department of Transport, SAP and IT architects history**

The Department of Transport chose to work with SAP software back in the year 2000. In that period, SAP was looked at as the future IT standard for enabling any of the supporting processes. Between 2001 and 2002, the first implemented module was SAP R/3 HR. The existing personnel information system was in urgent need of replacement at the time. Prior to the actual implementation, substantial Enterprise Architecture work was done. Goals were to, on one hand, enable the decision making process for further implementation of SAP functionality within the Finance function, and, on the other, blueprint the future business processes, information management, and the underlying information technology.

The trajectory mainly focused on the Department of Transport's financial administration, including, among other things, the budgeting and reporting cycle. The solution included a number of SAP R/3 modules, such as Public Sector Management (PSM) and the SAP Business Information Warehouse (BW), including Strategic

Enterprise Management (SEM). The latter is used for the registration of budget mutations.

After the go-live of SAP as the Finance system, at the beginning of 2005, all regular SAP operational management tasks were centralized within a specific unit, a so-called SAP Center of Excellence (CoE). At the same time, the predominant role of Enterprise Architecture was significantly reduced. As it turned out after some time however, an SAP-rich Enterprise Architecture is in need of maintenance - just like the SAP systems and their infrastructure are. The beacons that ensure a sustainable IT landscape need to be maintained, just like the waterway markings do. This showed from a number of incidents which occurred in the period following the initial two SAP projects.

*'En waar wild en onverdroten iedereen zijn gang kan gaan.' [1]*

*<'And where everyone can do as he pleases, wildly and unwearingly.'>*

What followed were hectic times. And even that is an understatement. As said, many projects were initiated during 2005. They started very energetically, flawlessly following the standard SAP implementation approach which the Department has fine-tuned over the past years. Some of them used the latest in SAP technologies; others adopted recently established national standards or crossed the boundaries of the Department. A bulk of new technology was brought in: mobile infrastructures, internet portals with online service counters, digital Record Management, digital inspections, management dashboards, interactive electronic forms, you name it. All were magnificent applications of Information Technology, some of them straight from the SAP lab. And eventually most of the projects even made it to becoming productive.

### **A growing pains era**

Quite innovative, all of these - most definitely. And in all fairness, most projects were in support of strategic goals set by the Department. But the Department soon found itself facing quite a few issues, for instance in

the operational sphere. How to keep the entirety of distributed data, the myriad of SAP systems and the underlying technical infrastructures tuned into one another in a controllable fashion? How to at the same time remain sensitive to the consequences of IT change for the organization? And on top of that, how to continue to be responsive to new business requirements?

The high-level supervision of all of these aspects used to be an accountability of the Enterprise Architects (EA). But as said before, this capability had hardly had any budgets assigned to it after the first two major SAP projects. The absence of Architecture Governance had given headway for unbridled growth of the number of SAP technologies. One reason for this is that the Enterprise (IT) Architects' involvement in planning the decentralized Program and Project Portfolio had been zero to none. The added value of Enterprise Architects namely for one lies in the holistic view they bring to the table.

This is really complementary to what seems to be in the DNA of many SAP professionals: a very strong focus on functionality. Looking at a solution alternative in a holistic way includes paying sufficient attention to issues such as master data, cross-project dependencies, IT security aspects, sustainability, the end user experience or usability, re-usability, the necessary environments for designing, building, testing, running and managing any new SAP solution, and of course, to finish off with, the physical infrastructure including networks and telecoms. Ignoring any of these aspects poses a threat to the success of implementation projects. The Department re-adopted Enterprise Architecture (EA) as an instrument to control risks and decided to take the EA capability to the next level of maturity.

### **Enterprise Architecture as a risk control instrument**

When I first arrived in 2006 (EA budget had gone up a bit), my first intervention was to get involved during the preparatory phase of projects. As mentioned earlier on, while

preparing and/or executing projects, several aspects are easily forgotten or typically fail to get the right amount of attention. Ignoring those aspects in most cases leads to missing deadlines, de-motivated people, or budget overruns. To give you a more vivid image, I will demonstrate this with some examples of risks. Successively, I will address Information and Data Management, IT infrastructural interdependency, IT Security aspects, IT Service and Operations, and finally, the selection of IT solution alternatives. After elaborating on risks in these areas, I will summarize the lessons learned when joining IT Architects and the SAP world.

Here are five risks that can lead to SAP implementation failure:

**Risk #1: Neglecting cross-landscape Information and Data Management;**

**Risk #2: Leaving IT infrastructural interdependencies unexplored;**

**Risk #3: Not paying sufficient attention to IT Security aspects;**

**Risk #4: Late involvement of IT Service and Operations;**

**Risk #5: Taking a shortcut when selecting the right solution alternative.**

**Risk #1: Neglecting cross-landscape Information and Data Management**

Back in 2005, the SAP R/3 functionality for supporting the Department's Finance processes was taken into production successfully. Administering business partner data formed part of that functionality. Next to this, the Department had opted for centralized data entry. Newly started projects often had a dependency on data in the financial domain – and that is exactly where issues started to arise. An example I used earlier on was that of license requests via an online Digital Counter (see box 1).

While applying for a license via this Digital Counter, the applicant's data is retrieved using a so-called DigiD - a personal information record maintained by the central government and available via a web service. If acquiring the license costs money the applicant becomes an account receivable, in Finance speak. A type of business partners being manually maintained by the central Finance function using SAP R/3. In other words: when someone applied for a license that needed to be paid for, the current Data Governance process prevented this from being executed on-line in an end-to-end manner. On top of that, the existing SAP R/3 environment was shielded off from the internet anyway. To conclude, the project chose to not store data on this new account receivable in the R/3 Finance application used by the Finance Department, but preferred storing them in the Business Partner functionality that had become available from SAP more recently.

It required quite an effort to reach a solution that met the standards of all parties involved. This just goes to show that even when working with a standard package, the attention for Information and Data Management should never be allowed to weaken.

**BOX 1 – Digital Counter project**

*In 2006, the Transport and Water Management Inspectorate started providing ship-owners with the opportunity of digitally applying for their seaman's books and boat master's certificates and following these processes through the internet. The further implementation of this new service will take place one step at a time. The Transport and Water Management Inspectorate aims at gaining experience and it wants to be able to directly find and improve flaws in the application process. At the end of 2007, seventeen ship-owners were connected to this digital service [2].*

**Risk #2: Leaving infrastructural interdependencies unexplored**

‘Boxes and wires’, an often heard banality referring to the complex world of technical infrastructural components: computational power, data storage capacity, bandwidth, and a number of ‘Quality of Service’ requirements. A world which holds many secrets for the average SAP consultant - they sometimes appear to be up on cloud nine, assuming that technical infrastructure can be put into place overnight. And even with a virtualized infrastructure, whether or not sourced from ‘the cloud’, this is not the case.

The previously mentioned project around the maintenance of waterway markings, for instance, did not only entail adding a new functionality in SAP R/3 - Mobile Asset management (MAM)) - but equally tagged along the completely new installation of a large middleware component. This extra layer between SAP R/3 and the MAM client software running locally on laptops is known as the Mobile Infrastructure (MI). The lead time for getting this up and running was vastly underestimated, which resulted in largely missed deadlines.

The project evolving around the Digital Counter had shortly beforehand equally led to the introduction of new products in the SAP landscape: the SAP Enterprise Portal (EP). As it turned out, that portal environment was in popular demand by other projects as well – leading to substantial performance issues.

In such complex SAP environments it is simply a bare necessity for projects to timely acknowledge the requirements for technical infrastructure and to pro-actively take action upon it.

**Risk #3: Not paying sufficient attention to IT Security aspects**

The SAP Enterprise Portal (EP) was, as mentioned earlier, a beloved environment with many projects. Apart from its infrastructural impact, this type of environment also has implications in the IT Security sphere. The Security concept in the Portal differs substantially from the good old

SAP R/3 environment, in terms of user, identity and access management.

The effort around synchronizing user master data with the R/3 back-end and implementing access control was hugely underestimated at first. Next to that, the outsourcing partner had hosted the internal Portal environment in its heavily secured data center, ensuring no ‘baddies’ could ever force their entry from the internet. But that is equally where the biggest challenge lied when this internal Portal had to be turned into an external Portal, connected to the internet. This was a requirement in, for instance, the Digital Counter implementation project. Reaching the Portal environment in the data center from the internet in compliance with the IT Security policy of the Department was a huge problem. With the help of the hosting partner involved, secure access was realized in the end. But time lines were largely missed again, not to speak of the budgetary consequences.

Surprises can never be completely ruled out, but it is of the utmost importance to consider IT Security aspects and consequences as early on as possible. The SAP CoE proved to have learned their lessons though. When a request came in for a project aiming to reduce the number of Sign-On moments (Single Sign-On), the SAP CoE decided to first conduct an architectural study. An SAP Enterprise Architect critically looked into the request, and into various more or less apparent aspects related to it. This allowed the SAP CoE to discover several potential pitfalls and to define a couple of more future-proof solution alternatives.

In the SAP world, this architectural approach seems hardly known. If the SAP CoE had started on the implementation of the request straight away, the pitfalls would have had a serious impact on the run time and the budget, and the solution would not have been as future proof as the eventual one. ‘Proper preparation prevents poor performance’ is a well-known adage that most definitely applies here as well.

#### **Risk #4: Late involvement of IT Service and Operations**

Even way back when mainframes were still the standard, it was already good custom to clearly define the handover from 'Development' to 'Service and Operations' – the solution development project was only released after the newly developed solution was accepted into 'Business as Usual'. Fair is fair: where 'boxes and wires' are concerned, this hardly ever leads to any problems any more.

Infrastructure Management has become a mature profession. The challenge arises at the complexity of packaged software, such as SAP's. These packages do not only offer functionalities to the end user, they equally include maintenance and support functionality to ensure the packaged software runs smoothly. When projected to Service and Operations aspects, this means a difference should be made between Functional Application Management (FAM) and Technical Application Management (TAM) – aka SAP Basis. The latter in turn is a different beast from Infrastructure Management (IM) albeit you often see TAM and IM joined at the hip these days. Adding a Mobile Infrastructure (MI) or an Enterprise Portal (EP) to the SAP landscape requires adjustments in the way TAM is set up. Timely involving 'Service and Operations' in a project is and will remain a bare necessity – right from the start of the project if you ask me.

Even though this was standard practice with the SAP CoE, it remained difficult to effectuate. Specifically when working with new SAP components, knowledge transfer to the Service and Operations team often appeared to be a challenge, for example because of capacity or skills challenges. The effect of this was that projects stayed in-flight much longer than estimated beforehand.

#### **Risk #5: Taking a shortcut when selecting the right solution alternative**

It is often said that common sense disappears when politics appear. This is a well known area of tension for Enterprise Architects.

Something that looks like a very obvious solution when purely judging the facts will not always be the actually selected solution because of other interests. The Department tackles this as follows. In order to make optimum choices for long term investments in SAP, this SAP CoE develops architectural studies or Position Papers.

I have been involved in researching topics such as end-user experience, SAP Business Process Management (BPM) and Service-Oriented Architecture (SOA). The architectural studies or Position Papers usually provide a lot of clarity and direction. In the case of the position paper on end-user experience, it led to factual agreements and implemented improvements. Concerning BPM and SOA, it turned out to be more complicated to transform the study's results into clear, formal principles, standards and guidelines for future projects. Without these, projects run unnecessary risks though. Without a 'formal' foundation however, conflicts always lie in wait. An SAP knowledgeable Solution Architect, with multi-year experience in SAP, can come a long way in steering projects in the right direction.

The examples of end-user's experience and Single Sign-On have already been mentioned. Another example lies in the field of Portfolio Management (SAP xRPM). Infected by the enthusiasm of the supplier, the SAP CoE was asked to implement the business-preferred solution, called SAP xRPM, as soon as possible. An architectural study led to several tangible steps, but equally to the observation that at this stage, the chosen solution for portfolio management was an expensive step too far.

The SAP CoE found it is not always easy to thoroughly and unambiguously define the precise goals of an architectural study. We did experience nonetheless that these studies or Position Papers had increasingly become a strong instrument for clearly setting the boundaries of SAP trajectories and thus, an instrument to reduce the risk of a project wondering off in the wrong direction.

Nevertheless, everyday practice can in some cases overtake carefully made plans. New legislation, budget cutbacks or reorganizations sometimes cause a lack of connection between the solution under development and the changed reality, in spite of brilliantly effectuated architectural studies or not. It will never be possible to completely rule this out – agility is key here, to be anticipated upon during the development of the architecture study.

### The step towards SAP EA maturity

It is evident that mitigating risks deserves full attention before starting a project. In order to do so in a structural manner, the Department looked into possibilities to increase the level of maturity of the Enterprise Architecture (EA) function. Points of interest which have passed in review at the Department were amongst others perking up the alignment with other decentralized architectural functions, improving the connection to customer requirements in various functional domains, and standardizing the rendered architectural services as well as used terminology, based on an architectural framework (SAP EAF / [TOGAF8.1](#) [3]). The findings of the evaluation of architectural frameworks were very interesting – the idea for *ArchitectedERP* was born in this period.

### Summary of lessons learned from mitigating the described risks

IT Architects and SAP - certainly a compatible set. They have to be. SAP software has become an undeniable part of many IT landscapes. It is finding the right way of joining them that still seems difficult at times. The goal of the SAP architectural function within the Department is to get and stay in control of and integrate the whole of data structures, SAP and non-SAP systems, and technical infrastructure, while continuously keeping track of the organizational consequences and business agility. All of this based upon the wish of reducing the chance of taking painful, wrong decisions. The right time for discovering and mitigating risks is the preparatory phase of any SAP implementation. The typical broad approach

of experienced and SAP-knowledgeable Enterprise Architects largely increases the chances of being complete and thus, increases the chances of the project being successful. Over the years, the Dutch Department of Transport, Public Works and Water Management has become experienced in combining IT Architecture and SAP. This article narrated on various aspects of importance for IT Architects who get in touch with the non-functional side of SAP. In short, the 7 lessons learned are:

1. Staying focused on **Information and Data Management** remains equally important when dealing with packaged software, although profundity is not equally essential in every case;
2. In complex SAP-rich environments it is just a bare necessity for projects to timely acknowledge the requirements for technical infrastructure and to pro-actively take action upon it – even if you have organized your **IT infrastructure** in a Utility Services, SaaS or Cloud fashion;
3. SAP has its own security concepts that vary depending on whether you're dealing with an ABAP or a Java stack. Look across the SAP boundaries however when architecting **user, identity and access management**;
4. Timely involving '**IT Service and Operations**' in a project is and will remain a bare necessity – right from the start of the project, on an operational level; on a tactical level, during decision making on the Project Portfolio;

5. Prevent taking a shortcut on **solution alternatives**. In order to make optimum choices in long term investments in for instance SAP, the Department's SAP CoE develops architectural studies or Position Papers. That is an extraordinary valuable approach. We learned that securing the outcome of these studies and socializing them with decision makers as well as with the people executing the project requires a significant effort;
6. The architectural approach demands that clear arrangements be made with various stakeholders regarding scope and time lines. Safeguarding these agreements should be in the hands of somebody with project **management capabilities**;
7. Involve an **SAP Solution Architect** in projects. When in the preparatory phase of a project, evaluate whether the size of the project, the business risks and the number of degrees of design freedom involved justify bringing an IT Architect on board.

As it turns out, it is not that simple getting the SAP world acquainted to 'working under architecture'. Even now that SAP themselves are taking the huge step towards 'services thinking', or BPMS/SOA, the thinking patterns and habits which have become imbedded in the SAP world are not that easy to adjust. Getting used to a new approach like described in [ArchitectedERP](#) takes time.

*'Alarmfase 2 is hier nauwelijks nog berucht' [1]  
<Amber Alert is hardly infamous here anymore>*

To end with the Dutch pop group Bløf again, the alert phase indicates an unacceptable, suffocating situation. Undesirable not only during the implementation phase of SAP but equally during the operational run phase of live SAP environments. To prevent any alarm phase from occurring, the Dutch Department of Transport and Water Management supports a structural positioning of IT Architects with a firm SAP background on enterprise as well as project level.

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Literature and links:

- [1] 'De Zeeuwse kunst', BLØF, Naakt onder de hemel, 1999
- [2] Annual report 2007 –Working on safety together, The Transport, Public Works and Water Management Inspectorate
- [3] <http://www.opengroup.org/togaf>
- [4] 'EA Techniques for SAP Customers', Derek Prior, AMR Research, October 2007

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