Survey about SOA adoption by organizations in Brazil

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Abstract: Service Oriented Architecture (SOA) is a model that has established itself as a strong trend in the business and information architectures. Organizations that adopt SOA can take advantage of its benefits for their business and technical areas. Benefits include: (1) Increase in: agility, efficiency, reuse, interoperability, consistency of systems and return on IT investment. (2) Reduction in: costs, redundancy in IT assets, IT burden. In addition, SOA allows an easy adjust of applications, providing fast response to changes in business processes. Nowadays, there are several worldwide surveys discussing the SOA adoption stage in many countries. This is the first study conducted in Brazil, which analyzes SOA adoption by organizations in the country. The study used a methodology based on assessment questionnaires applied to invited organizations through a survey. This article discusses its results, revealing an insight of the Brazilian SOA scenario.

1. Introduction

The Service Oriented Architecture (SOA) is an architectural model created to improve organization’s agility and cost efficiency, while it reduces the overall burden of information technology (IT). Consequently, it increases the organization’s Return of Investment (ROI) [Erl 2008a].

One of the most pursued SOA strategies is the high level of service reuse. It leads to ROI (Return of Investment) maximization, increases resource sharing and reduces the effort to build new functions [Marks and Bell 2006].

The interest in how to apply SOA concepts and how to improve its usage is growing. This is happening due the dissemination of SOA architecture [Manes 2011]. Researches are being conducted worldwide by academies, organizations and specialized IT centers as APQC [APQC 2011], Forrester [Forrester 2010], Intersys [Intersys 2005] and Gartner [Tan, 2009]. [Intersys 2005] survey shows the Australian SOA scenario. Meantime, [APQC 2011], [Forrester 2010] and [Tan 2009] surveys are being answered by organizations all over the world, especially in North America and in Europe.

These surveys evaluate the progress of SOA adoption, analyze the use of SOA patterns and, after thorough analysis, disseminate trends in SOA. They also show SOA adoption challenges faced by organizations. For instance, professional skills, technological resources, early expectations, SOA governance, SOA metrics are well-known SOA
challenges. Although those studies are very important to a general SOA scenario, they were not conducted in Brazil. Brazil is a country with a growing IT industry, and a market of US$ 85.1 billion in 2010 [Brasscom, 2010]. Therefore, to make a clear picture about SOA in Brazil, it is important to perform a research like that, customized to the Brazilian reality.

This paper introduces the first assessment survey concerning SOA adoption by organizations in Brazil. It highlights and measures the main challenges and benefits of SOA adoption. For example, the lack of SOA professionals in the market is a serious issue in Brazil. Another difficulty is the effort required to implement SOA, considering aspects such as security, governance and service granularity. Thus, the study presents an overview of the current Brazilian SOA scenario. It also addresses required actions to make SOA initiatives successful.

As a methodological premise, the organizations that completed the survey are organizations that were already implementing SOA. This strategy allowed a correct analysis by crossing information based on real SOA experiences.

The further sections of the paper are organized as it follows: Section 2 presents the methodology used in this study, Section 3 presents the survey results, Section 4 shows the main discussions and, lastly, Section 5 draws the conclusions.

2. Methodology

This study started researching for existing surveys about SOA adoption ([APQC 2011; Forrester 2010; Intersys 2005 and Tan 2009]). They were carefully analyzed and its results were used as source for a similar survey addressing the Brazil scenario. An assessment questionnaire was created. Organizations with SOA projects were localized and invited to take part in the survey. It was used several mechanisms to find organizations including the participants of the 4th International SOA Symposium (2011).

I order to organize the information for a better evaluation of SOA adoption, the assessment questionnaire was separated in 8 sections: (1) SOA Strategic relevance. (2) SOA Benefits. (3) SOA Challenges. (4) SOA Projects. (5) SOA Workforce. (6) SOA Investments. (7) SOA Technology. (8) Organization’s Industry sector information. The survey has a total of 35 questions.

The questionnaire was elaborated for organizations that were already using SOA and could notice its benefits and challenges. Its purpose was not only to evaluate SOA benefits, but also its challenges. The survey was available online during six months using a web survey tool. An online survey tool was chosen in order to facilitate access and management.

Considering the strategic focus of SOA [Manes 2011], the survey had as a primary target the managers of the business area. This is because business analysts have a deeper understanding of the enterprise’s strategic goals and needs. Thus, they can better coordinate such a job, involving the IT area as needed [Manes 2011]. However, only 26% of the participants identified themselves as business managers or business analysts. Therefore, the survey was mostly answered by managers from technical areas.

Finally, the questionnaire took under consideration the technological and business perspectives of SOA. It allows a deeper analysis of the trends and results of SOA
adoption through a business and technological point of view.

3. Survey Results

This section presents the most relevant results of the survey. Charts were developed in order to facilitate understanding the analysis and its results.

Only 110 questionnaires were completed, even considering the invitations for the participants of the 4th International SOA Symposium (2011) and other several mechanisms to find organizations and promote the survey. This number corresponds to 20% of the number of invitations. This information indicates that SOA is in a quite early stage in Brazil.

Table 1 represents organizations that answered the survey, classified by Industry Sector.

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>5</td>
</tr>
<tr>
<td>Financial</td>
<td>16</td>
</tr>
<tr>
<td>Industry</td>
<td>5</td>
</tr>
<tr>
<td>Services</td>
<td>11</td>
</tr>
<tr>
<td>Media</td>
<td>5</td>
</tr>
<tr>
<td>Public Sector</td>
<td>32</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>11</td>
</tr>
<tr>
<td>Transportation and Logistics</td>
<td>0</td>
</tr>
<tr>
<td>Retail</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 2 classifies organizations by size, according to their number of employees.

<table>
<thead>
<tr>
<th>WORKFORCE</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>up to 19 employees</td>
<td>5%</td>
</tr>
<tr>
<td>20-99 employees</td>
<td>5%</td>
</tr>
<tr>
<td>100-499 employees</td>
<td>21%</td>
</tr>
<tr>
<td>500-999 employees</td>
<td>16%</td>
</tr>
<tr>
<td>1000-4999 employees</td>
<td>11%</td>
</tr>
<tr>
<td>5000-9999 employees</td>
<td>21%</td>
</tr>
</tbody>
</table>

Figure 1 shows SOA adoption time, while Figure 2 displays the stage of SOA adoption inside organizations.
These figures give evidence that organizations that have used SOA for a longer period of time – 3 years or more – have SOA in departmental or organizational stage.

The following figures – 3, 4, and 5 – demonstrate how organizations perceive SOA’s objectives and benefits. Figure 3 presents the success level of SOA adoption. Figures 4 and 5 show business and technical benefits achieved by organizations in Brazil.
Figure 4 shows that organizations noticed that SOA added value to their business. Organizations are experiencing business benefits like ‘Increase of the business and technology alignment’ and ‘Improvement of IT efficiency’. In general, the technical benefits are widely achieved. Therefore, in Brazil, SOA initiatives enforce technical aspects rather better than business aspects.

The principal challenges encountered in the SOA adoption process can be observed in Figure 6.

The organizations face problems regarding the lack of skilled professionals, the implementation of governance and the establishment of service granularity. Despite the fact that SOA initiatives in Brazil are technically driven, these limitations indicate the difficulty of hiring professionals to support the organizational demands of SOA projects.

Figure 7 shows how organizations behave towards SOA workforce. The study asked about how organizations train and hire employees or external consulting to support SOA projects. Even with the lack of professionals with SOA skills, external consulting and external training has no significant relevance for 40% of the organizations.
Figure 7. Workforce

Figure 8 presents the involvement of business analysts in SOA projects.

37% of the organizations demonstrated maturity including a business analyst in all their SOA projects. Not a single organization entirely dispenses the participation of a business analyst in their SOA projects.

SOA governance can be observed in Figures 9. Its presents the governance maturity classification inside those organizations.

Only 5% of the organizations classify their governance as ‘Mature’. Thus, even though governance is rated as “Crucial” [Erl 2008], it is not being put into practice. This can be a high-risk threat to SOA initiatives.

4. Discussions

According to Table 1, 32% of the organizations are from the "Public Sector". Moreover, 32% have a workforce above 1,000 employees (Table 2). These results demonstrate that SOA has been studied and applied by large organizations from major industry sectors.

Regarding the time that organizations have been using SOA, 68% of the organizations answered “less than 4 years” (Figure 1). 28% are still in the pilot or evaluation phase (Figure 2). These numbers indicate that SOA is still in a ramp-up phase. This can explain the lack of SOA professionals and the low expertise.

Figure 3 presents a balanced scenario between the levels of success and failure of SOA adoption (60%/40%). Numbers are similar compared to [Forrester 2010] (65%/35%). Therefore, SOA adoptions by organizations in Brazil are on its way towards maturity.
Even so, the results could be improved by enforcing SOA’s concepts and principles.

Concerning the business and technical benefits, in average, only 30% of organizations noticed business benefits according or above expectation (Figure 4). On the other hand, 45% have achieved technical benefits as expected or even have exceeded expectations (Figure 5). Comparing these results with [Tan 2009], there are discrepancies related to business benefits: (1) Increase of the business agility, Brazil - 22% against [Tan 2009] - 50%. (2) Reduction of coast, Brazil - 15% against [Tan 2009] - 46%.

On the other hand, it is possible to verify the alignment of this study with [Tan 2009], regarding technical benefits. The reuse was broadly achieved. 50% of the organizations answering it positively. A wide participation of technical employees answering the survey can explain this number. There are much more technical people involved in SOA projects than business people. Therefore, the business area needs to participate more to SOA initiatives. SOA adoption by Brazilian organizations is technically driven. This means that in Brazil the corporate strategic planning do not addresses SOA. That is a risk, because SOA’s benefits are obtained on the long run, as a consequence of maturity and planning.

Figure 6 shows how much organizations noticed specific challenges. The biggest challenges faced by organizations during SOA adoption was the establishment of service granularity (55%) implementation/management of the governance (55%) and the lack of skilled professionals (65%). [APQC 2011] shows that the main challenge faced by organizations is to understand necessary skillsets for the correct use of SOA principles. Therefore, in general, it is a great challenge to hire specialized people and consulting to support SOA projects.

In addition to the upcoming scenario, the relevance of hiring (employees or consultants) and training (internal and external) was not considered important. An average of 46% of organizations considered hiring and training neither important nor very important (Figure 7).

According to Figure 8, for 84% of the organizations the involvement of business analysts in SOA projects is, at least, reasonable. Additionally, they consider the adoption of Business Process Modeling (BPM) one of the most important trends on planning future IT initiatives. Thus, there is a strong concern about reaching a mature alignment between business and IT with SOA.

Another key point of the survey was to evaluate SOA governance. 58% of the organizations believe governance is a critical factor of success for SOA adoption (Figure 9). In contrast, 69% of organizations have no governance or use it insufficiently (Figure 10). Therefore, regarding SOA governance maturity, Brazilian organizations are still a step behind.

5. Conclusions

In the Brazilian market, SOA is heading for a large-scale adoption. However, there are still challenges to overcome, including the lack of human resources.

It is clear the anxiety of achieving immediate results and benefits. Organizations in Brazil are not concerned about the strategic principle of SOA: the achievement of benefits coming from a maturity process, which demands a long time. That is an import point even for the organizations that are using SOA over 2 years, and could realized
some of its technical benefits.

Most of the organizations do not consider the support of external consultants as relevant, even in the early stages of SOA adoption. SOA is a complex architecture and its implementation requires the help of specialized professionals.

In the public sector, SOA is adopted in a superficial manner; once there is no further analysis of the strategic goals and requirements of the Corporate Governance. This is not recommended and can make SOA’s benefits unachievable.

This work was used as the initial reference for the PhD thesis [Mazzarollo 2014] which proposes a framework for Servicer Oriented Architecture maturity level evaluation.

References


