**NEWTOWN BANK Ltd.**

**Increasing Profitability with better IT Infrastructure Investments**

Construct a synthesis grid

**Specializing**: service-oriented architecture

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# **1. Summary**

## Benefits of SOA and Newtown Bank

### 1.1.1 Characteristics of SOA and its benefits

Generally, SOA is an architectural style for building loosely coupled distributed systems that deliver application functionality as services to be used for end-user applications(Ho, 2003).

There are **four main characteristics**. First one is Modularity. It means that an SOA decomposes the existing application architecture and structures it into a manageable number of partially autonomous subsystems. Second one is loose coupling. It means that the logical and run-time dependencies between services are as low as possible. Third one is standards. SOA relies on compatible interfaces and the use of open and widely standards to intercommunicate with different components. The last one is using web services for easier communication and cooperation over a network for components(Mueller, 2010).

**SOA can benefit business** in aspects of better integration, flexibility, reusability and low cost. Firstly, it enables decomposition and recombination of new and pre-existing functionalities into an overall service oriented reference model towards an enhanced degree of application integration. Secondly, web-based SOA is a key technological enabler for more agile forms of IS development and is able to deliver a good level of flexibility without the need to freeze service specifications at any stage of the development. Thirdly, most of the SOA services could be reused with minor changes which affects little consumers. Finally, SOA could help in cutting IT spending by aligning the business and technology environments to match the request for change ability and reusable business functionality(Richard, 2005).

### 1.1.2 How SOA benefits Newtown Bank

According to the benefits of SOA mentioned above, **it can benefit Newtown Bank to achieve its IT-related goals**: (1) Improve the flexibility for future developments; (2) Provide potential ability for greater organizational agility and competitiveness with other banks; (3) reduce cost, thus increase the return on IT infrastructure investments;

When it comes to the **specific problems and requirements** in Newtown Bank, SOA can help in explaining and solving the problems following:

1. 30% of core business software (to be kept in house) is legacy code. By redesigning the organizational architecture with SOA, the code for core functions can possess modularity and loose coupling. It could eliminate the bad effects of legacy code that is separate information storage files for different business activities. Modularizing business units benefits Newtown Bank in allowing a quick and easy composing of services that will optimally meet current requirements(Mueller, 2010). While loose coupling benefits Newtown Bank in lowing the dependencies between services.

The knowledge above has met the **requirement** 1,2,3,4,5,7.

1. IT infrastructure at end of life. This problem means that business software of Newtown Bank is difficult to change or enhance. With SOA, business software is reorganized into services which could be reused with minor changes that affects little consumers(Richard, 2005). Besides, standard SOA relies on compatible interfaces and the use of open and widely standards(Mueller, 2010), which can support the development of core function and the integration with external services.

The knowledge above has met the **requirement** 6.

1. No flexibility in IT infrastructure. SOA is a key technological enabler for more agile forms of IS development and is able to deliver a good level of flexibility without the need to freeze service specifications at any stage of the development(Richard, 2005), and for better data quality(Nils, 2011).

The knowledge above has met the **requirement** 6.

1. TCO of IT infrastructure too high. This problem means that business software is expensive to run and support. SOA could help in cutting IT spending by aligning the business and technology environments to match the request for change ability and reusable business functionality.

The knowledge above has met the **requirement** 6.

## Risk of SOA and Newtown Bank

### 1.2.1 General challenges and risks

While SOA brings benefits to business, it also poses some challenges to managers. Firstly, the service concept is difficult to define in practice, and the managers may struggle when defining the difference between classes, components and services(Khalid, 2011). Secondly, due to non-experience on development of SOA software, the bank has to train people to manage and develop the new application. Thirdly, the complexity of aligning business and technology makes it difficult to include business managers in the development of SOA landscapes. Finally, the lack of communication standard and immature development tools pose more challenges to SOA(Richard, 2005).

### 1.2.2 How Newtown Bank mitigate risks of SOA

The Bank need to hire and train experienced specialists to mitigate those risks by developing clear frameworks and design detailed service units based on business objectives.

# **2. Recommendation**

1. To solve the problem that 30% of core business software is legacy code, Newtown Bank should apply SOA to redesign the organizational architecture and business software to modularity and loose coupling. Because modularity allows services composed and to meet current requirements, while loose coupling can lower the dependencies between services, which could eliminate the bad effects of legacy code. Involved IT infrastructure are business software and IT specialists in development.
2. To solve the problem that IT infrastructure is at end of life, Newtown Bank should apply SOA to business software to reach better ability of changing and enhancing. Because organizing software in services could increase reusability and standard SOA can support the development of core function and the integration with external services. Involved IT infrastructure are business software and IT specialists in development.
3. To solve the problem that there is no flexibility in IT infrastructure, Newtown Bank should apply SOA to business software to increase flexibility. Because it can enable any further development without the need to freeze service specifications at any stage of the development. Involved IT infrastructure are business software and IT specialists in development.
4. To solve the problem that total cost of ownership of IT infrastructure is too high, Newtown Bank should apply SOA to business software to cut IT spending by aligning the business and technology environments to match the request for change ability and reusable business functionality. Involved IT infrastructure are business software and IT specialists in development.

# **3. Glossary**

|  |  |
| --- | --- |
| **term** | **Definitions/explanations** |
| Service-oriented architecture (SOA) | generally, SOA is an architectural style for building loosely coupled distributed systems that deliver application functionality as services to be used for end-user applications. (Ho, 2003) |
| Modularity | An SOA decomposes the existing application architecture and structures it into a manageable number of partially autonomous subsystems—that is, domains and services. (BENJAMIN, GOETZ, CHRISTINE, AND GEROLD, 2010) |
| Loose coupling | the logical and run-time dependencies between services are as low as possible. (BENJAMIN, GOETZ, CHRISTINE, AND GEROLD, 2010) |
| web services | a service offered by an electronic device to another electronic device, communicating with each other via the World Wide Web. (BENJAMIN, GOETZ, CHRISTINE, AND GEROLD, 2010) |
| Business agility | the "ability of a business system to rapidly respond to change by adapting its initial stable configuration” (Nils Joachim, 2011) |
| CMS system | A content management system (CMS) is a computer application that supports the creation and modification of digital content. It is often used to support multiple users working in a collaborative environment. (Richard Baskerville, Marco Cavallari, Kristian Hjort-Madsen, Jan Pries-Heje, Maddalena Sorrentino, and Francesco Virili, 2005) |
| Legacy code | source code that relates to a no-longer supported or manufactured operating system or other computer technology |

# **4. Synthesis grid on service-oriented architecture from ass4**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **In‐text citation of source in APA 6thformat** | **Definition and explanation of characteristics of the IT strategy in which you are specialising** | **General benefits** | **General challenges and risks** | **Risk mitigation** | **Information in the source specifically relevant to Newtown Bank’s problem, goals, and requirements:** | **Page no. and quotes** |
| (Mueller, 2010) | Modularity: An SOA decomposes the existing application architecture and structures it into a manageable number of partially autonomous subsystems—that is, domains and services. | allows a quick and easy composing of services that will optimally meet current requirements, lead to agility, complexity reduction, increased reusability, and better interoperability. | Complexity | By developing a clear framework | **Related problems:**  This principle is for solving the problem of “legacy code” by modularizing business units. | p.147  “SOA as an Architectural Style” |
| **Related goals:**  Improve the flexibility for future developments. |
| **Related requirements:**  related with requirement3,4,5,7, helping in explaining What is SOA, the benefit of modularity, and the challenge is improved complexity of designing, as well as the transition of system update. |
| (Mueller, 2010) | Loose coupling: the logical and run-time dependencies between services are as low as possible. | essential for the dynamic binding of components. | Complexity | By developing a clear framework | **Related problems:**  This principle can solve the problem of “legacy code” by loose couple design. | p.147  “SOA as an Architectural Style” |
| **Related goals:**  Improve the flexibility for future developments. |
| **Related requirements:**  related with requirement3,4,5,7, helping in explaining What is SOA, the benefit of loose coupling, and the challenge is improved complexity of designing, as well as the transition of system update. |
| (Mueller, 2010) | Standards: relies on compatible interfaces and the use of open and widely standards: | important to ensure interoperability and to guarantee seamless integration | Compatibility | Introduce state-of-art design in the industry. | **Related problems:**  This principle can support the development of core function and the integration with external services. | p.148  “SOA as an Architectural Style” |
| **Related goals:**  provide potential ability for greater organizational agility and competitiveness with other banks. |
| **Related requirements:**  related with requirement3,4,5,7, helping in explaining What is SOA, the benefit of standard interface, and the challenge is problem of compatibility of different components, as well as the transition of system update. |
| (Mueller, 2010) | Using web services: easier for components to communicate and cooperate over a network | applied to overcome platform and vendor dependency, reduce cost. | Security problem | Increase specialist in security. | **Related problems:**  This principle can support the communication between core functions and the access of customers at anytime anywhere. | p.148  “SOA as an Architectural Style” |
| **Related goals:**  Reduce cost, thus increase the return on IT infrastructure investments. |
| **Related requirements:**  related with requirement3,4,5,7, helping in explaining What is SOA, the benefit of web service, and the challenge is security problem among online transaction, as well as the transition of system update. |
| (Nils, 2011) | Better Business agility | shorter time-to-market and Cost reduction | lack of industry standards and mature tool. | Improve standard. | **Related goals:**  Reduce cost, thus increase the return on IT infrastructure investments. | p.7  “SOA’s Business Impact” |
| **Related requirements:**  related with requirement4,6, helping in explaining the economic benefit of SOA to bank industry. |
| (Nils, 2011) | Better data quality | Reduce data complexity |  |  | **Related goals:**  Increase data quality, better ability of competitive. | p.7  “SOA’s Business Impact” |
| **Related requirements:**  related with requirement4,6, helping in explaining the economic benefit of SOA to bank industry, for banks, quality of data affects the mature of business process, more qualified more better understanding the customers. |
| (Nils, 2011) | Business/IT alignment | improved relationship with the business units |  |  | **Related goals:**  Better business alignment, better ability of competitive. | p.7  “SOA’s Business Impact” |
| **Related requirements:**  related with requirement4,6, helping in explaining the economic benefit of SOA to bank industry, for banks, Better collaboration with different business units, easier to develop business lines. |
| (Khalid, 2011) | usage and maintenance challenges |  | resistance from staff | Train people | **Related requirements:**  related with requirement5,6, helping in explaining the challenges in usage and maintenance of SOA. | p.641  “usage and maintenance challenges” |
| (Khalid, 2011) | Complexity of designing |  |  | developing a clear framework, based on rigorous analysis, analyze their business process carefully | **Related requirements:**  related with requirement5,6, helping in explaining the challenges in complexity of designing of SOA. | p.641  “usage and maintenance challenges” |
| (Richard, 2005) | For instance, in the CMS system, whenever a cash amount is involved, the number of bills exchanged should be defined. The legacy system, on the other hand, is able to deal only with a total amount for each currency. The new service, based on a reference model that is closer to the teller view, translates, whenever necessary, the number of banknotes into a total amount, masking the underlying legacy transaction and hiding the complexity of functionality extension. | allows a quick and easy composing of services that will optimally meet current requirements, lead to agility, complexity reduction, increased reusability, and better interoperability. | Complexity of designing | developing a clear framework, based on rigorous analysis, analyze their business process carefully | **Related problems:**  Explaining the bad effects of “legacy code”. | p.9  “CASE: CENTRAL EUROPE BANK” |
| **Related goals:**  The bank case helps in offering comparison. |
| **Related requirements:**  Related with requirement1,2: helping in explaining the problems of “legacy code” and their root cases; and also:  Related with requirement4,6:  helping in arguing the benefit of SOA and the specific effects in banking industry through the comparison case. |
| (Richard, 2005) | Reusability of business components (i.e. of Web services) has already been demonstrated by subsequent projects in the Central European Bank, where new functionality was added to the original business components, e.g. by adding new methods or by adapting the existing ones. | Increase the reusability means reduce cost of developing new version, improve flexibility to meeting changes. | Complexity of designing | developing a clear framework, based on rigorous analysis, analyze their business process carefully | **Related problems:**  Explaining the case about easily changing and enhancing of applying SOA | p.9  “CASE: CENTRAL EUROPE BANK” |
| **Related goals:**  The bank case helps in offering comparison. |
| **Related requirements:**  Related with requirement4,6:  helping in arguing the benefit of SOA about developing new version and changes, the specific effects in banking industry through the comparison case. |
| (Ho, 2003) | Definition: generally, SOA is an architectural style for building loosely coupled distributed systems that deliver application functionality as services to be used for end-user applications. |  |  |  | **Related requirements:**  related with requirement3, helping in explaining What is SOA. | p.6  “SERVICE ORIENTED ARCHITECTURE” |

# **5. Bibliography**

Ho, H. (Producer). (2003). What is Service-Oriented Architecture. *O’Reilly XML.com*. Retrieved from <http://www.xml.com/pub/a/ws/2003/09/30/soa.html>

Khalid. (2011). Realizing service migration in industry—lessons learned.

Mueller, B. (2010). *Understanding the economic potential of service-oriented architecture*.

Nils. (2011). A Literature Review of Research on Service- Oriented Architectures (SOA): Characteristics, Adoption Determinants, Governance Mechanisms, and Business Impact.

Richard. (2005). Extensible Architectures: The Strategic Value of Service Oriented Architecture in Banking.

# **6. Reflection**

**Joys**: It is enjoyable to write out the research I have done about SOA and offer recommendation.

**Frustrations:** not satisfied with the format of my assignment, due to limited table space with too much information.

**Learnings:** I learnt how to addressee the points that my clients want.

**Questions/Comments:** still have no ideas about other two specializing topics and the additional benefits gained from synergy of implementing three strategies.