# Business Engineering and Service Design with Applications

# For Health Care Institutions

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## Prolog

For more than fifteen years I have been working on the development of the foundations of what I call Business Engineering, with the aim of providing tools, as other engineering disciplines have, for the design of businesses. This effort has been directed to show that enterprises can be formally designed and that their architectures, including processes, people organization, information systems, IT infrastructure and interactions with customers and suppliers should be considered in a systemic way in such design. This Enterprise design is not a onetime effort, but, in the dynamic environment we face, organizations have to have the capability to continuously evaluate opportunities to improve their designs. Others researchers have recognized this need, as the ones who have worked under the idea of Enterprise Architecture (EA), but they have mostly concentrated on the technological architecture and just touched on the business design issues. Our work resulted, more than ten years ago, in a graduate program of study, the Master in Business Engineering at the University of Chile[1], which has been taken by several hundreds of professionals. Such Master has been the laboratory where many of the ideas we propose have been tested and many new ones generated as generalization of the knowledge and experience generated by hundreds of projects developed in the theses required by this program.

I have published books (in Spanish) and papers (in English), all detailed in the references, that touch on different topics of my proposal. In this work I give a compact summary of it with two new additions: the adaptation of our ideas to services, based on work we have been doing in this domain for at least five years, and an application to hospital services design, where we have performed research and development efforts by adapting our approach to provide working solutions for a large number of

Chilean hospitals. These solutions are already working and showing that large increases in quality of service and efficiency in the use of resources can be attained.

Our approach includes the integrated design of a business, its service configuration (architectures) and capacity planning, the resource management processes and the operating processes. Such approach is based on general patterns that define service design options and analytical methods that make possible resource optimization to meet demand. This is complemented with technology that allows process execution with BPMN and BPMS tools and web services over SOA. In summary we integrate a business design with Analytics and supporting IT tools in giving a sound basis for service design.

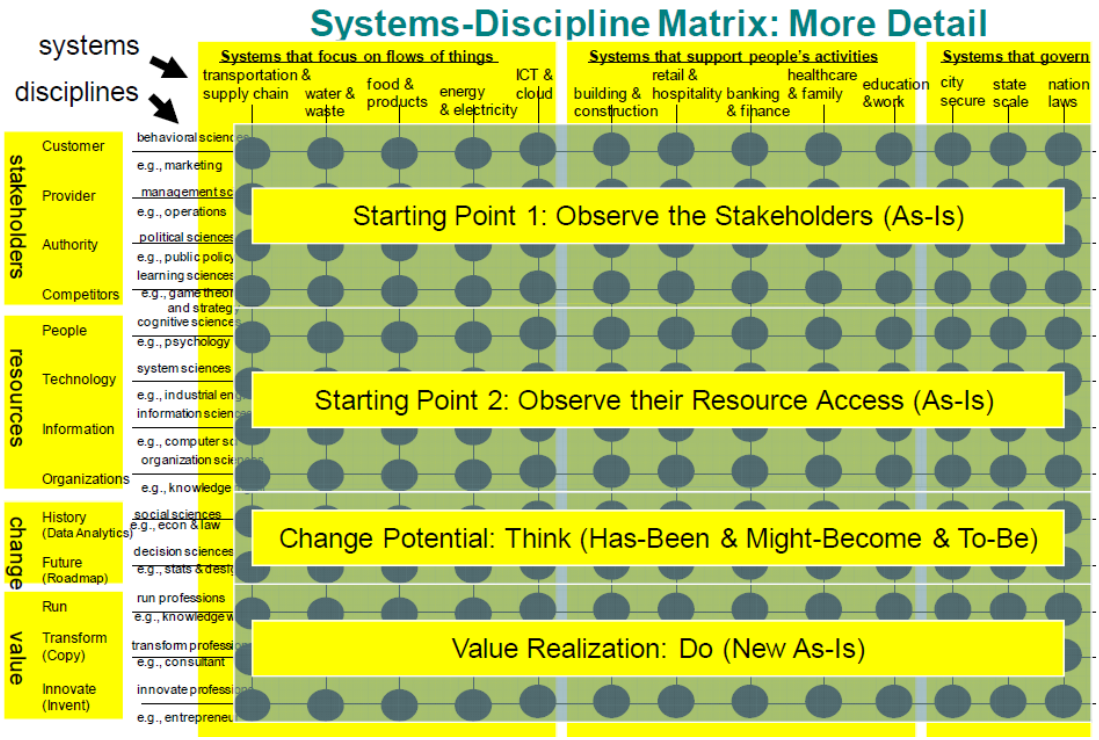
General patterns provide reference models and general process structures, in given domains, as a starting point to design the processes for a particular case. The key idea is to formalize successful design knowledge and experience in these models, reuse such knowledge when designing and avoid reinventing the wheel. Patterns are normative in that they include what it is recommended as best practices and the ones we have found that work in practice in hundred of projects, as it has been remarked before. So they contain specific guidelines on how a process should be designed, allowing reuse of such patterns, thus avoiding to start from very expensive “as is” process documentation, proposed by methodologies such as $BPM^2$. It is our experience that “as is” documentation is very expensive, running into the millions of dollars for large organizations, and there is a low to medium probability that the effort ends in failure, because of killing of the project without any result whatsoever. This has been the case of two large government agencies in Chile, which spent more than one million dollars each on "as is" studies and eventually decided to terminate the projects because of lack of results, and two large banks and one of the leading holdings companies of the country, which have had similar experiences.

There are two key concepts that characterize our proposal for Business Engineering: Ingenuity and Form. We posit that good engineering requires Ingenuity to design the innovative solutions businesses require in the extreme competitive environment that organizations currently face. Thus our emphasis on systemic, integrated and innovative business design explicitly oriented to

make an organization more competitive in the private case and more effective and efficient in the public case. On the other hand, the design has to materialize in a Form, in the traditional architecture sense proposed by Alexander[3], which can follow certain patterns based on existent knowledge that provides a starting point for such design. Software engineers took their pattern ideas[4] from Alexander and this is also the inspiration for our patterns proposal.

One particular characteristics of this book is that it illustrates all its ideas and proposals with many real cases, coming from projects that have been implemented in practice and provided very impressive results, which are detailed in the text. The cases show how the same design guidelines we will present successfully provide good results in very different situations and environments.

As Spohrer and Demirkan propose in the presentation of the series in "Service Systems and Innovation in Business and Society", of which this book is part, I embrace the idea of integrating scientific, engineering and management disciplines to innovate in the services that organizations perform to create value for customers and shareholders that could not be achieved through disciplines in isolation. The integration developed in this book can de located in the Spohrer and Demirkan´s System-Discipline Matrix, included below, as centered on "Systems that support people´s activities" that are designed with the participation of most of the disciplines defined in the matrix. Thus, for example, as it will be presented in this book, quantitative marketing –with the tools of Data Mining- is used to model customers needs and options; Management Science allows characterizing providers´ logistic; Economics theory permit to model competitors´ behavior; knowledge management and change management define people roles in service change; Industrial Engineering and Information Sciences provide the tools for information analysis and supporting tools definition; and all these disciplines plus Strategic Planning, other Analytics -as Optimization Models and Business Analytics-, process modeling and design, project management and others serve as a basis to generate ideas to produce and implement a design that realizes the value for the customers and stakeholders.




Hence, this book is completely aligned with the purpose of this series and its contribution is to provide an original Business Engineering approach that emphasizes service design and derives an integral and systemic solution that starts with Strategy and Business Model definition, follows with business design, processes design and information system design and finished with a well planned implementation.

Prolog Endnotes

[1] Information about the Master in Business Engineering can be obtained at its web site MBE (2013), where there are links to Facebook, Linkedin and Tweeter; also the blog Barros (2013) contains books, papers and theses related to the MBE.

[2] Brocke and Rosemann, Editors (2010).

[3] Alexander (1964).

[4] Gamma, Helm, Johnson & Vlissides (1995).

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