

IT and business organization: the evaluation of application portfolio in Edison S.p.A.

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Track: Processes

1 The purpose of the paper

The value chains of today organizations are deeply influenced by Information Technology (IT), considering its fundamental support for the coordination in and between companies. IT allows to create innovation in the organizational processes, improving the companies' system of relations with stakeholders (clients, suppliers, employees, and competitors) and the involvement of people that must share business strategies.

The ability to understand, or even to anticipate, business needs is the necessary input to create value for the whole organization and so to transform IT into «business technology». In this context, it's important to capture expectations and to proactively rationalize the company's application portfolio, in order to avoid obsolescence, support the convergence, manage related costs, and increase general benefits for the organization.

From their invention to the present, an increasing number of computer-based information systems have been supporting an increasing number of functions and processes within and between businesses. Enormous numbers of applications gives rise to a high level of complexity for IT Management, responsible for implementing, integrating, operating, and further developing them. With the increasing focus on corporate globalization, Chief Information Officers (CIO) face even more complex challenges to rationalize their IT portfolio; they have to optimize IT systems deployment within the organization.

As the scale and complexity of the data and information companies produce and consume within their business continues to grow so too has the requirement to share it across and beyond organizational units. How then is it possible to continuously maintain a clear understanding of which applications are relevant and supporting today's business objectives? It is possible, but requires a shift in the IT governance and strategic planning processes with greater understanding of the business capabilities and the organizational characteristics.

Maintaining a sound and meaningful portfolio of applications is so a struggle for many organizations. Applications are developed in-house, bought in and added through mergers and acquisitions in a continuous and often uncontrolled manner. The scientific literature about the management of application portfolio is mainly focused on matrices, which are adequate for obtaining an overview but not sufficient for reaching informed decisions about how to deal with an application and for interpreting the management of application portfolio as an organizational challenge.

The goal of this paper has been to find how an application portfolio can be successfully managed and to understand how applications are related to organizational and business processes.

The analysis has been based on the following research questions:

- which principles are key to improve the management of application portfolio and support application destiny decisions?
- how the information about the state of each application can be transformed into action, to improve organizational processes?

To answer these questions, the case of Edison S.p.A. has been investigated through a qualitative analysis. The main problem areas of the company were low rate of application flexibility, difficulties related to legacy applications and lacking control of the application portfolio. To deal with the situation the IT Management investigated a way of increasing the control of the application portfolio and defined a strategy for its migration over an integrated platform. The intent of the initiative was not only to rejuvenate the portfolio and gaining more control, but also to increase the level of alignment between IT and business processes, and prepare for changing requirements in the future.

The topic of the paper is strictly related with the overall theme of the conference, since in the last 30 years, application portfolios of complex organizations have been characterized by great and continuous expansion. This trend is supported by growing business requirements, new technologies diffusion over the market, and major focus on globalization.

The contribution is also related to the following areas of investigation:

- 1) *Organization*, because experience suggests that optimizing IT systems architecture is not longer sufficient; it's necessary to improve their deployment within organizational units.
- 2) *People*, because they use applications but also for the substantial evolution in the role of CIO, whose competencies actually does not regard only technical aspects, encompassing managerial characteristics (leadership, inter-functional vision, attitudes about IT budgeting and cost management).
- 3) *Processes*, since it's necessary to structure the application portfolio evolution as: a) a long-term group of activities, to be integrated with IT governance practices; b) aligned with the business view and the strategic plan, as a part of the company's general strategy; c) strictly linked to the company's core processes, to assure coherence between business performances and existing systems.

2 The theoretical background

Today, most organizations in all sectors of industry, commerce and government are fundamentally dependent on their information systems (Ward & Peppard, 2002); moreover, IT investments represent a great deal of many organizations annual budget (Lin & Pervan, 2002).

According to Magoulas and Pessi (1998), the application architecture and the system architecture are synonymous and define the main applications needed to handle data and support the organizational functions. They also states that the focus of IT management is, among other things, to give guidance for which systems are needed, how they are going to interoperate and how to migrate from the current situation, in order to: a) get control over this great number of systems; b) terminate systems that do not provide sufficient business value anymore; c) find several ways to get more out of the legacy systems compared to actual organization.

According to Ward (1987), the most common way of visualizing a portfolio is through the use of different matrices; the approach has been widely adopted because it reduces a large set of alternatives into a comprehensible number of options. One of the first and most well-known matrices for classification of information system environments is the *Strategic Grid*, which

was developed for the purpose of assessing an organization's total application portfolio and determine the management approach required from the business (McFarlan et al., 1983).

Since then, the *Strategic Grid* has been complemented and enhanced by other various models. Weill and Vitale (1999) introduced the *Health Grid*, based on the concept that, considering *technical quality* and *management value* as dimensions of analysis, it's possible to distinguish the following options: *Upgrade*, *Nurture*, *Question* or *Consolidate/Eliminate*. The *Health Grid* is not very different from the *Legacy Matrix* proposed by Sommerville (2001), which is constructed with the dimension *business value* instead of *management value*.

Nhampossa (2004) investigated strategies to deal with legacy information systems using Sommerville's *Legacy Matrix*, taking as the primary concern of the study the processes involved when dealing with legacy information systems. Instead Hirvonen (2004) investigated how the maturity of an enterprise can affect how the organization benefits from using application portfolio models for planning, evaluating and managing information systems and concludes that, in order to use the matrices, a certain level of maturity is necessary.

Fabriek et al (2007) defined a rationalization approach for the application portfolio, dealing with reducing the complexity of existing applications in the portfolio. By using the rationalization approach, an organization can analyze its applications basing on *technical quality* and *uncommon programming language* and thereby make a decision about the whole category, to *discard* (parts of) them, *replace* them, *redevelop* them or *invest* in new applications.

Kwan and West (2004) proposed a model for the analysis of all systems in an organization considering the relative importance of the applications and the respective alignment to strategic goals. The resulting framework contains four stages of IT importance: *support*, *mission critical*, *strategic* and *laboratory*. These showed that the importance of an application changes over time.

At last, Swanson and Dans (2000) made their study in the area of systems retirement and replacement. They investigated the relation between maintenance effort and system life expectancy and found, among other things, that larger systems are associated with a greater life expectancy, not only a greater maintenance effort. They also found that older systems have

shorter remaining life expectancy, as should be expected, but also that there is no direct association between older systems and greater maintenance effort.

Hence, the scientific literature relates to several different application portfolio methods, which generally aim to «assess the health of an IT application portfolio» (Weill & Vitale, 1999), «rationalize the application portfolio» (Fabriek et al, 2007), «propose strategies to deal with legacy information systems» (Nhampossa, 2004) and «enterprise IT portfolio management» (Kwan & West, 2004).

But the management of application portfolio represents an organizational challenge, since technologies can deeply affect information, products, and services flows of a value chain, becoming a way to coordinate activities and resources in the organization and between organizations (Champy, 2003). IT can assume a determinant role both for the reengineering of internal processes, and for the redesign and integration of business processes (Venkatraman, 1994).

The linkage between IT and business, often referred to as «alignment» (Henderson & Venkatraman, 1999), is an important objective for CIO (Horner Reich & Benbasat, 1996). Obtaining a fit between IT and business is not going to happen by itself, and will not bring any benefits unless it is exploited continuously and shaped to the business needs (Henderson & Venkatraman, 1999).

The way of managing IT assets is more important for organizational performance than the level of spending (Irani, 2002) but, actually, the organizational impact of application portfolio evaluation has been explored only by advisory companies, and mainly by Gartner. The gap has been confirmed by the analysis of academic contributions of the last five years¹, denoting a substantial lack of case studies that could be useful to improve existing models.

¹ Literature analysis has been realized on the abstract of contributions, in the years from 2010 to 2014, of these publications: *European Journal of Information Systems*, *Information Systems Journal*, *Information Systems Research*, *Journal of AIS*, *Journal of MIS*, *MIS Quarterly* (first 6 excellence journal and review according to the ranking of Association for Information Systems (AIS)), *Information & Management*, *Management Science*, *Sviluppo e Organizzazione* and *Economia & Management*. The same results has been produced by the analysis of the first 20 pages of *Jstor Archive Collection* and *Google Scholar*, related to the keywords «Application Portfolio Management» and «Management of Application Portfolio».

3 The chosen approach and the method of analysis

In the light of previous consideration, we decided to analyze the case of Edison S.p.A. In March 2013 the company started a process for the application portfolio assessment, in order to obtain detailed information about existing applications and to enforce the organizational know-how about them.

Research methodology: qualitative analysis through direct interviews

Interviewed people: IT Manager and Project Consultant

Period: December 2014 – February 2015

Goals:

- how an application portfolio can be successfully managed by organizations?
- how decisions about the destiny of an application are related to organizational processes?

The model actually used by Edison to manage applications has been realized through a more than a year project, characterized by continuous reflections and reviews as to the starting concept, not only to assure the quality of deliverables but also to create a wide and flexible database for organizational needs.

Considering the complexity of the project and of the company's organization, we structured interviews basing on the following sections:

1) Application strategy

The idea that organizations need to develop a strategy for their applications is a matter of supreme importance. An application strategy must be responsive to all of the decisions that have gone before and provide a degree of comprehension about the business and technology changes that are occurring in the organization.

In this section, questions were focused on:

- the main aspects the company considered in order to improve knowledge about existing applications;

- how the company found a relation between the characteristics of existing applications and involved organizational functions.

2) *Application inventory*

The creation of a register of all applications in use, the projects in-flight, and the proposals for new applications considered by the organization allows to improve the quality of actual and future decision making. The inventory should start one process at a time, and must be capable of being analyzed from many different perspectives and used for many different purposes.

In this section, questions were focused on:

- the main characteristics and the granularity degree of captured information;
- how the consolidation of collected information allowed the company to better understand the alignment between applications, organizational activities, and business strategy.

3) *Application assessment*

Independent business unit decisions often can overlap with existing capabilities in the organization, and perhaps even with initiatives being conducted in other business units at the same time. The assessment is fundamental to understand if the applications in use or being proposed may not meet the current and the future needs of the organization, and to avoid applications become unwieldy to manage, because of duplications and aging technology.

In this section, questions were focused on:

- the relation between the assessment degree of complexity and the company degree of maturity;
- the main approaches used to realized the assessment activities;
- the evaluated performance aspects that allowed company to understand the organizational and business impact of applications.

4 The main findings and contributions

Interviews has allowed to understand the main principles Edison used to improve the management of application portfolio and how this kind of projects is deeply related to the organizational system at all.

Particularly:

- a) The analysis of application portfolio requires not only to consider the link between applications and supporting infrastructures, but also to comprehend how applications can sustain different functions, in order to identify the company's capability maps and cross-functional relations, under a process perspective. In Edison, all information about existing applications have been collected in a single database and organized in functional areas, to reduce data fragmentation and simplify their consultation. The so created application master is steadily updated, after new information have been checked both by Demand Manager, for technical aspects, and Project Manager, for business process aspects.
- b) The evaluation activities are based both on applications' value and risk profile, and can have different complexity degree in coherence with the organization's maturity stage. In Edison, the starting concept of the analysis was specifically focused on enterprise architecture and so characterized by a purely technical nature. The following data collection has pointed out all limits of the above said concept and lead to a wider focus, including further differentiated values and involving a plurality of different actors (organization, infrastructures, and security).
- c) The standardization and the consolidation of data about the application portfolio must be based on a rational analysis of the goals and the informative depth a company wants to obtain. It's fundamental the file tuning on various data cluster, to be defined in relation with the purport of inventory activities and the informative needs of specific process owners. In order to understand the relation between its application portfolio and organizational peculiarities, for each application Edison decided to collect information about: 1) used technologies and main functionalities; 2) actual conditions and criticalities; 3) internal and external referents (*Business Unit Manager, Demand Manager, Provider*); 4) supported functions, business lines (*product or segment*), and processes (*core, support or*

- general management*); 5) the impact on *business risks* (for the ability to support utilities production) and on *image risks* (for the ability to improve relations with final customers).
- d) The application assessment involves reflections about the capacity of IT to be an enabler and requires to do leverage on core applications (about 10% of the total portfolio). In order to identify its most strategic applications and to obtain a complete evaluation, Edison decided to structure the assessment activities basing on the following qualitative and quantitative aspects: 1) the support to business processes and to strategies that have a direct impact over the mission; 2) the contribution to organizational operations; 3) the technical match with to-be architecture.
- e) As organization grows and change so the application database do. Constant updating activities allow to increase values reliability, to develop useful know-how, and to favour the cultural change. Edison is actually analyzing how the introduction of digital technologies can have an impact on the realized model and lead to rethink used variables.

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