Strategy in the making: Assessing the execution of a Strategic Information Systems Plan

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Abstract. Recent research on IT Strategy is in a phase of renewal, after a long period of static formal comprehensive planning. Currently, more importance is given to incremental continuous planning, program implementation and organizational learning, what has been labeled as strategy as practice. However, less attention has been paid to the evaluation of the implementation process and results.
In this paper, we introduce an exploratory approach for assessing the implementation of IT Strategic planning, based in the combination and iteration of different methods. It is grounded in an Action Design Research exercise recently made up at a leading on-line European university.
The assessment includes three major dimensions (strategy, performance and governance), extracted from the academic and professional research. Its application to this context through a varied scaffolding of methods, tools and techniques, that is summarized in the article, seems robust, able to work out with the business and IT senior stakeholders and allows a quick deployment, even in a complex institutional environment.
We propose further research in order to extend and validate this model through its implementation and evaluation in different contexts, selecting new variables and metrics, developing improved maturity frameworks and repeating the exercise on a periodical basis.

Key words: Strategic Information Systems Plan, IT Strategy Evaluation, IT Strategy Implementation, Higher Education

1 Introduction

IT Strategy formulation (more specifically Strategic Information System Planning or SISP) is living a period of far reaching renewal, both in its content and in the processes of strategy making [53]. This is due to the convergence of business and IT strategies in a new brand Digital Transformation [11] and to the consolidation of the "strategy as practice" school [43, 61]. Strategy is now considered an ongoing social process and literature has experienced a shift towards "the realities of strategy formation" [31](p. 372), such as incremental planning, program implementation, strategy evaluation and organizational learning. But, over this evolution not much interest has been paid to IS strategy implementation by itself, let alone the evaluation of the implementation process and results [3, 55].

This article is a part of a broader practice-oriented research on the process of Strategy making in the Universitat Oberta de Catalunya (UOC), a foremost European on-line institution. The implementation of its SISP (named Information Systems Master Plan or ISMP) [46] has been recently evaluated and the Plan is being updated nowadays. The researcher is a member of the leading team of the project, in an Action Design Research mode [50]. The piece presented here collects the process, methods and outcomes of the evaluation phase (we prefer the term "assessment").

Our working hypothesis is that evaluating the implementation of the strategy planning on a periodical basis, if properly conducted, executed and communicated, is crucial a) to attain the results of the intended strategies, b) to adapt and update them to emerging threats and opportunities, c) to ensure common understanding and ownership of the information projects between business and IT and d) to ensure organizational learning and transformation, this latter being one of the most compelling challenges in an academic institution [10]. Our aim is to validate existing models of IT Strategy evaluation in complex organizations, to provide novel insights and to contribute to the development of better approaches and methods.

On the following pages we summarize in Section 2 relevant research in the field of assessment of the execution of a SISP. Section 3 provides basic information of the setting of the research, i.e., the institution and the status and contents of the ISMP. Section 4 presents the research approach, methods and tools and Section 5 highlights the main results of the evaluation process. Finally, Section 6 concludes with discussion and proposals for researchers and practitioners.

2 Related research

The study of SISP has attracted considerable scholar attention since the 1980s. On the grounds of reported lack of implementation or severe implementation problems of IT Strategy planning, some papers were issued intended to identify prescriptions and critical factors for better strategy formulation [19, 23, 27, 36, 39, 51, 54]. Nevertheless, much less interest has been paid to IS strategy implementation by itself, and even less to the evaluation of the implementation process and results, which is the focus of this work [12, 13, 15, 16, 20, 22, 24, 37, 48, 55, 59].

In 2008, Teubner and Mocker [55] studied a sample of 434 papers published in major MIS journals between 1977 and 2001. Of those, only 21 were related to implementation. Although with a different methodology, in 2013, Amrollahi et al. [3] found 9 papers on implementation and 8 papers on evaluation, out of 102 papers on SISP published between 2000 and 2009. Following this thread, we retrieved and analyzed some more recent ones. Most of them describe comprehensive SISP methods put into practice in individual settings, with a special consideration to implementation and evaluation issues as compared to former literature constructs: they thoroughly document the development phases, process and techniques, people and organizational interactions and, to a lesser extent,

Table 1. Dimensions of assessment

Dimension	Key concepts	Main references
Strategy	Alignment	Henderson and Venkatraman [28], Chan and Reich [14], Juiz and Toomey [32]
	Intended and realized strategies	Mintzberg and Waters [41], Chan et al. [13], Vaara and Whittington [58]
Performance	Benefits realization	Ambrosini et al [2], Parker et al. [42], Ashurts et al. [5], Hunter et al. [29], Ward and Daniel [60]
	Program execution	Thiry [56], Meskendahl [40], Kopmann et al. [35]
Governance	Stakeholders satisfaction	Galliers [22], DeLone and McNeal [17,18], Gable et al. [21], Petter et al. [44]
	Program management and governance	Bartenschlager et al. [8], Thiry [56], Isaca [30]

the measurement of success [4,33,62]. Interestingly, some of the latest are Case and Action Research studies in the Higher Education industry [7,34,52].

Salmela and Spil [47] proposed a framework of "cycles" and "choices" of planning that could be flexibly adapted to the needs, the context ant the maturity of each organization and could be improved and refined over time. Taking that approach, we selected from the analysis of the academic and professional literature and discussed with the Customer[1], a model of assessment aimed to evaluate the main achievements and pitfalls over the execution of the Plan, to update the Plan accordingly with new business priorities and to improve its governance. From these considerations and other of practical nature (available information, coordination costs, time-frame), we chose three major dimensions of analysis and two categories of key concepts for each dimension (Table 1). The application of these concepts into specific methods is shown in Sections 4 and 5 of this article.

3 Research setting

The UOC is the oldest fully online University in the world. Founded in 1995, it now enrolls 75.000 students, 300 full-time professors and 3.000 associate part-time professors, provides 57 graduate programs and runs a budget of 98,8 M€. It operates within a public-private funding and governance regime, in a highly-regulated environment. The current governing board, appointed in 2013, designed an ambitious growth and transformation strategy [57], of which the ISMP for the period 2014 to 2018 was an instrumental part. The annual budget allocated to the Plan is about 3 M€, out of a total IT budget of 7,8 M€. The IS department (reporting to the Chief Operations Officer) has 49 internal and 79 external full-time employees.

The IT expenditure vs. revenue and the weight of the strategic or transformational projects within the portfolio of IT assets is remarkable and could be

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[1] In this context, "Customer" is the usual term used in Action Research [9].

Table 2. Content of the Information Systems Master Plan (ISMP)

1	Customer and community relationships management
2	Learning management environment and learning applications
3	Mobile first: responsive web site and mobile apps environment
4	Enterprise data management
5	Student Information System
6	Administration support (finance, human capital, other)
7	Technology architecture and migration to the cloud
8	User experience transformation
9	Digital empowerment and change management
10	Security and data privacy

well compared with the figures of digital industries [26], such as software and Internet services. The fact of being a pure digital player makes critical for the UOC the effective exploitation of information technologies in the global and rapidly evolving market of Higher Education and long life learning [1, 6, 25, 38, 45, 49].

The ISMP was structured in 10 strategic initiatives (meaning collections of programs and projects aimed to a single business objective) and 42 individual projects to be deployed over a period of 4 years (2015-2018). Since its inception, the ISMP was designed as a) a top-down transformation program, b) addressed to renovate the core business applications and the technology infrastructure base, c) ruled by the top management and d) led and executed by the CIO (Chief Information Officer), d) with the support of a Program Office [46]. Table 2 shows the major strategic initiatives that make up the Plan.

The assessment process studied in this paper was carried out in the Summer of 2017. To conduct this effort and to prepare a proposal for the Executive Board of the University, a Steering Committee (SC) and a project team (PT) were settled. A researcher in IS was commissioned by the University as the project co-leader, took part in most of the workshops and meetings and carried out personally individual interviews with prominent members of the management and the faculty. This latter commission was made explicit, both as a support to the management and as an Action Research exercise. The researcher was able to work with scientific rigor, freedom of action and independence but his proposals regarding the method had to be adapted to the available information and the organizational context, within a demanding time-frame. An organization chart of the project is shown in Table 3.

4 Research methods

The overall framework of this research is an Action Design Research [50] approach. Under this paradigm, a toolkit combining different techniques and tools methods was proposed for the deployment of the assessment. For example, a case study stance was taken to better understand the original ISMP and the changes

Table 3. Project organization

Group	Role	Members
Steering Committee (SC)	Discuss and approve final and intermediate outcomes. Raise proposals to the Executive Board of the University.	CEO, Vice-Chancellor of Learning, COO, CFO, Dean of the Computer Science School, Leader of the PMO, Researcher
Project team (PT)	Gather and analyze data and documents, prepare and lead meetings and workshops, summarize conclusions and write reports and presentations.	Project Office of the ISMP (PMO), IT Demand Manager, Researcher
Project sponsors	Secure time and resources. Communicate and act in favor of the project.	COO, CIO
Project co-leaders	Plan, monitor and execute tasks. Prepare final deliverables.	Head of the PMO, Researcher
Researcher	Proposes methods and professional and scientific references. Co-leads the project team. Runs top individual interviews.	Lecturer and researcher in IS Management at the Computer Science Department

produced over time. A quantitative and qualitative independent survey was ordered to better capture the satisfaction and feedback of the major stakeholders. The different work streams are correlated and the process works through a number of iterations. The timing, the content and the setting of individual and group interactions over the project were critical, as it was their preparation through previous analysis of the bulk of materials produced by the Program office and the project leaders. A summary of this toolkit is shown in Table 4. The assessment was completed in ten weeks. Forty two people of different ranks (mainly top and middle managers) took part, with an estimated effort of 800 man hours.

To complete our research purposes, an additional round of in-depth reflective interviews with members of the PT, the sponsors and the SC were conducted between October and December of 2017.

5 Results

Next, we will show the main results of the assessment process, arranged according the different dimensions (Table 1) and work streams (Table 4).

Table 4. Research methods

	Strategy	Performance	Governance
Key concepts	Alignment. Deliberate and emergent strategies.	Program and project execution. Benefits realization.	Satisfaction of key stakeholders. Program and IT Governance.
Input and sources	Business Strategic Plan (2014-2020). Original IS Master Plan case study PMO execution reports.	PMO execution reports. KPI standard inventories of IT impact. Management reporting.	Online survey to managers and key users (115 respondents). Individual interviews to executives (23). (Source: report by external evaluator.)
Process	Qualified impact matrix. Overall analysis (2 iterations). Semi-structured interviews with top management (11).	Structured workshops with executives and managers for feedback and analysis (12). Lessons learned workshop (1) and individual report.	Results included for discussion and refinement in top management interviews and workshops. Internal discussion with sponsors and Project Steering Committee.
Participants	Members of the Project Steering Committee. Members of the Board of Executive Directors.	Business executives and managers (28). IT Project Leaders (15).	All.
Outcome	Summary of conclusions.	Individual files per project (10). Prioritized issue map for Project leaders. Summary of conclusions.	Summary of key values and major qualitative conclusions.
Timeframe	June 15th-July 30th 2017.	July 15th-Sept. 30th 2017.	Survey: Feb. 2017. Further analysis: Sept. 2017.

5.1 Strategy

Strategic alignment The main business objectives were grouped into six categories, and rated in five levels of compliance, according to the potential vs. actual impact of each IT strategic initiative against each category. An impact matrix was prepared and discussed with the project team and the results were presented in a radar chart. The most successful initiatives were related with "process standardization", "productivity and collaboration" and "flexibility to compete", as compared to lower results in "excellence in research" and "student

Fig. 1. Strategic alignment
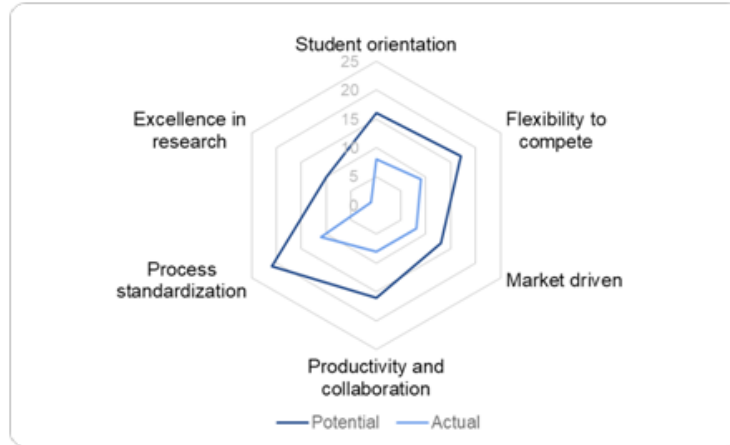
orientation" (Figure 1). Actually, those project related with the academic and academic support units show lower level of execution and higher deviations than the rest.

It may be said that the most relevant contribution of IT over this period has been to enable growth and provide scale advantages, by delivering technical infrastructure and business process support to serve more than double the number of students enrolled and almost triple the program offering, keeping constant the operational fixed costs. This seemed more than satisfying to the opinion of the SC.

Intended and realized strategies This dimension is related with the difference between the projects included in the plan and the ones which were effectively executed. The difference amounts to 2,1 M€ in a list of nine large projects, out of a total expenditure of 8,3 M€ in 23 large projects. Two of those unplanned schemes are related to major business shifts, as the change of the branding concept and image and the new multimedia format of learning materials. Those decisions were made by the Board of Executive Directors. Some other changes were related with mandatory legal issues or management style and preferences of newly arrived top executives. It may be said that the organization showed flexibility to adapt to major strategic changes, at the expense of a significant budgetary deviation and a lower execution of some planned projects. This observation deserved mixed judgment among the members of the SC.

5.2 Performance

Program execution We applied here the conventional "iron triangle" that compares the baselines of scope, time and cost with the realized outcomes. It explains the deviations within each planned project, not the emergence of new

Table 5. Factors affecting execution

Positive	Negative
Well defined business strategy and needs.	Slow public tendering procedures.
Strong and dedicated leadership of business managers.	Large cross departmental projects, especially those involving the faculty.
Clear technological solution.	Underestimation of integration and migration costs.

projects, that was explained in the former paragraph. For the scope dimension we broke down each major program into individual projects and each project into separate phases and milestones. The results showed an execution level of 89,0% in scope. The deviation in budget was of 14,2%. Major factors affecting execution were discussed within the team and with the project leaders. Results are shown in Table 5. The execution of the planned projects of the ISMP seemed very satisfying for the SC.

Benefits realization Of all the dimensions of analysis, this one was the least familiar and most difficult to acquire for the teams, be IT or business. It was also the most interesting to share with mid-level managers, since it allows to improve the quality and effectiveness of the dialogue between the two parties.

For its preparation, we first took several libraries of standard benefits coming from professional and academic sources (see Table 1), then selected a list for each major project and asked the IT project leaders to make a first review. Later we went to the administrative and faculty management teams to provide them with feedback on the program execution and open a discussion on the realization of benefits or specific performance impact and its measurement. In some cases, it was easy to identify key value indicators, find figures and establish a relationship with the program effectiveness. In others, it was not that easy. Table 6 provides some samples, separating those indicators which are suitable and measure value (left) versus those that only measure effort or activity (right).

5.3 Governance

Key stakeholder's satisfaction The Customer ordered a quantitative and qualitative survey in February 2017 to an external provider, as a proxy to understand the awareness, acceptance and commitment of executives, managers and key users (senior referrals of IT in every functional area) about the ISMP. This survey was used as an input for discussion in the various forums of the project. The main results are summarized in Table 7.

Respondents, mainly among the facullty, show a relative low level of awareness of the design and execution of the program. Contribution to the corporate strategy gets better scores than the response to individual needs. The major complaints from mid-level management were related with lack of information and lack of response to demands of incremental improvements (evolutionary maintenance) of the current legacy systems. In our interviews, top business and IT

Table 6. Suitability of the definition of Key Performance Indicators (samples)

KPIs measuring value	KPIs measuring effort/activity
Productivity and conversion rate of the call center.	User experience improvements.
Enrolments from target countries.	Availability and accessibility of new services at the classroom.
Increased multilingual portfolio.	New mobile apps.
Personnel per student ratio.	New management dashboards.
Regular users of Google Apps.	Files managed with the new academic administration application.
Time for processing the payroll.	Expenditure in cloud infrastructure.
Malicious IP addresses intercepted.	Training sessions and tutorials.
IT expenditure per student/ personnel.	New contingency platform.

Table 7. Key stakeholders satisfaction with the ISMP

Question	Areas		
	Administration	Teaching&Research	Average
Awareness of the ISMP	4,43	3,69	4,06
Contribution of the ISMP to the corporate strategy	5,07	4,50	4,78
Contribution of the ISMP to the different functional areas	5,02	4,05	4,53
Contribution of the ISMP to my area	4,64	3,88	4,26
Information about the execution of the ISMP	4,09	3,52	3,80
Overall rating	**4,64**	**3,88**	**4,26**

Values between 1 and 6 (higher is better). Respondents: 115. Response rate: 65%

management accepted these results as "expected", since the focus of the ISMP was precisely to renovate the core of the enterprise IT and to better respond to the corporate business strategy as compared to individual user demands. In any case, they acknowledged the risks of losing adherence to the ISMP among users, mainly academicians.

Program governance and management The execution of the ISMP was governed by a small Steering Committee, chaired by the Managing Director of the UOC. The Vice-Chancellor of Teaching participated in some sessions. The executive leadership was charged to a Program Office of two people and ten project leaders from the IT department, with a variable business counterpart for every project. The original governance model envisioned a broader picture with stronger involvement of the faculty. Nevertheless, during the implementation straight execution was preferred to greater participation. The satisfaction survey and individual and group interviews voiced complaints about lack of information regarding the priority setting mechanisms and the overall progress of the Plan.

Table 8. Lessons learned according to the IT project leaders

Order	Issue	Value
1	Lack of project leaders and managers	15
2	Lack of planning of business resources allocated to projects	10
3	Lack of project quality control end to end	9
4	Lack of business sponsorship, especially in cross-departmental projects	7
5	Poor project definition	7
6	Resistance to change when business process transformation is required	6

When performing the "lessons learned" exercises with the IT project leaders, they highlighted lack of resources, lack of business involvement and resistance to change as the major pain issues. Table 8 shows the main conclusions.

Finally, when discussing project management issues with top business managers, some expressed concerns on the quality of the project control mechanisms and proposed to select and develop project managers by their leadership and managerial skills, not so much by their technical capabilities.

5.4 Overall balance

After this review and the discussions with the different involved groups, the following conclusions were drawn regarding the perception of the stakeholders:

1. The ISMP is a valuable tool for setting priorities to transform the IT base and to increase the IT effectiveness, ensuring alignment and providing value.
2. The level of execution and the agility to adapt the Plan to new business priorities is also considered satisfying overall and has allowed the institution to support its objectives of growth.
3. The focus on the ISMP has been at the expense of the day to day demands of improvement of the existing legacy applications and tools.
4. The improvement of the corporate governance of IT is perceived as compulsory, with a major involvement of the faculty management leaders.
5. Better prioritization mechanisms, communication policies and project management processes should be put in place, to ensure shared commitment of the different constituencies.

This feedback is being taken into consideration for the update of the Plan and its governance mechanisms. It is worth to mention that some of the negative perceptions were considered predictable results and unavoidable collateral effects of the intended primal strategy as designed on the original ISMP.

6 Conclusions and discussion

IT Strategy making, now in the form of building Digital Strategies, is a major concern for IT and business executives and managers. Implementation issues have been the common pitfalls of the practice and the focus of a part of the research. The current paradigm advocates for an ongoing social process of strategy

formation or strategy as practice. This paper adheres to this stance. However, academic and professional literature has paid less attention to the evaluation of the implementation of IT strategies and the way to integrate that evaluation within a continuous and more agile Strategy planning.

This article, after an Action Design Research exercise, contains some elements to build up a method or artifact to conduct these type of reviews. According to the process and results, it seems to be a quick, effective and efficient approach, in agreement with our initial working hypothesis and the literature.

We have suggested to select three main dimensions of analysis: 1) Strategy (that observes strategic alignment and the response to emergent business strategies); 2) Performance (in terms of benefits realization and program execution); and 3) Governance (including the perception of major stakeholders and the mechanisms of decision making).

The assessment occurs in a short time-frame through intensive individual and group interactions. The governance, preparation, content, setting and selection of participants are all crucial. Additional reflective interviews are undertaken to better understand the process, results and consequences. It may be said that the process is part of the product: the overall outcome seems to be an improved understanding and commitment (a buy-in) of the top and middle managers regarding the Plan.

Regarding future work, the selection of variables and indicators and their measurement should be improved through further research and effective implementation. We initially suggest that a specific dimension related with organizational learning and deep business transformation should probably be better developed and integrated in the model.

Furthermore, those variables related with benefits realization need to be worked out within each specific context. An examination of various contexts of application and improved maturity models could facilitate better choices of analysis and intervention for both practitioners and researchers. We also plan to repeat the exercise periodically, to validate and improve this approach.

As regards the specific results of the analysis and its comparison with reported cases, that was not the aim of this piece of the research, but it may be also considered an interesting working line.

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