Adapting IS Strategic Planning methodology to define Mobile Strategy

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Abstract

The nature of mobile initiative in a company make them usually opportunistic and pragmatic. This leads inevitably to some incoherence and inconsistence in companies' passage to digital and mobile world. Mobile strategic planning is one solution to make mobile initiatives adhere to the global strategy and respect a more rigorous plan. We introduce in this paper a methodology for mobile strategic planning is based on Enterprise Architecture frameworks and our work on strategic planning SI. This methodology is intended to be light, pragmatic, iterative and incremental, so to be tailored to mobile applications and projects. We furthermore defined several methodological tools and techniques to better support the methodology.

Keywords: *Mobile strategy, IS Strategic Planning, Enterprise Architecture, Mobile usage, Mobile context, Mobile capabilities*

1. Introduction

In few years, new mobile devices, smartphones and tablets, have upset habits of hundreds of millions users around the world. They evolved from a 'simple' device to make a phone call or to send a short message, to appliances, as powerful as PCs, providing new applications like web browsing, mobile commerce transactions or access to a dashboard whose data is located in the enterprise information system.

Unlike traditional PC applications, mobile applications are distinguished by the intimacy characteristic and the integration of the user's contextual information.
Aware of the challenges of mobility, businesses and governments began to offer, more and more, new mobile services to their customers, prospects and partners through innovative solutions that combine responses to the needs of users, opportunities for value creation with mobile device capabilities (and possibly Information System capabilities). Thus, we see the emergence of new "m-services" such as m-health, m-commerce, m-government, m-marketing, m-ticketing, m-coupon, m-banking, m-finance services or applications more content, information or social oriented.

To plan the introduction and evolution of mobility as a new way of communication and management within the enterprise and as a new way to deal with partners and doing business, managers need a mobile strategic planning methodology tailored to mobile applications and projects.
We propose in this paper a methodology for mobile strategic planning based on Enterprise Architecture frameworks and our experience in information strategic planning. This methodology is intended to be light, pragmatic, iterative and incremental.

The second section will introduce strategic planning in general and particularly in the information systems domains. We will describe specific elements of mobility in the third section. The fourth section is dedicated to a detailed description of the proposed methodology and the fifth section will present the tools and techniques supporting the methodology. And we will conclude with a summary and future work.

2. IS strategic planning

2.1 Strategy and strategic planning

Strategy is defined by Chandler as "The determination of the basic long-term goals and objectives of an enterprise and

the adoption of courses of action and the allocation of resources necessary for carrying out these goals" [6] and by Porter as "The art to build durable and defendable competitive advantage"[7].

One of the most complete definitions was given by [8], "A fundamental framework for an organization to assert its vital continuity, while, at the same time, forcefully facilitating its adaptation to a changing environment."

For most of the definition, strategic planning is focused on three main questions:

- Where we are?
- Where we want to go?
- How to get there?

2.2 IS Strategic Planning methodologies

IS Strategic planning has been defined by [9] as the process of identifying a portfolio of applications/projects that can help an organization achieve its business strategy. Its focus is on defining the IT roadmap in term of key initiatives, projects and transformations to be made on the existing information system with two main intentions:

- How to align information systems with business needs and overall strategy?
- How to use information technology to change and impact the business?

Due to the complexity of today's information systems and the diversity of enterprise's technology approaches, many methods have been defined to structure the ISSP process and techniques have been defined to address some aspects of the discipline. [10] classifies ISSP methods into two categories:

- Impact methods : trying to make It help create a positive impact and drive the change of the business
- Alignment methods : where the main focus is on aligning IT to respond to business needs and to help achieve strategic goals

Among the methods used in IT Strategic Planning we have Critical Success Factors (CSF) [1] which could be considered as an impact and alignment method, Business Systems Planning (BSP) [1], Porter's Value Chain [7], and Scenarios [1]. Methods can be grouped together to constitute a methodology. Methodologies used for ISSP include those of the CCTA (12) and Boar (13).

Many IT vendors and consultancy organizations use proprietary methods and/or methodologies, some of which are adaptations of open source approaches. Examples are Arthur Andersen's Method/1 and Coopers and Lybrand's Summit [9]. It is also well known that organizations often develop their own in-house methodologies, often based on open or proprietary methods or approaches [9].

2.3 Our IS Strategid Planning methodology

In [16] and [17] we introduced a new methodology for IS strategic planning. This methodology is inspired from Enterprise Architecture Frameworks and brings more structure, standardization and industrialization to existing methodologies.

One of the major elements of the methodology is the metamodel that is used to describe the enterprise as a whole and the information system specifically. This metamodel brings a way to link the strategy to the defined target and the roadmap projects through the concept of transformation.

The suggested metamodel is composed of five layers:

- Strategy
- Business
- Information Systems
- Technology
- Strategic planning

All layers are interrelated with static and dynamic element of the three natures: function, structure and content. Every layer is connected with the layer below with a realization link. A process is automated in an application which uses a database and are both deployed in a server. This dependency is fundamental to align the IS with the Business Architecture and the Technology with the IS Architecture. This link allows us also to analyze the gap between layers in term of coverage to make it possible to fill this gap in the strategic plan[16][17].

In the context of mobility, we can consider mobile applications as part of the information system with specific attributes.

We suggest adding mobility attributes to all metamodel objects to make sure we capture mobile requirements, constraints and capabilities.

For example, we can add an attribute mobile channel to Business Processes to indicate whether a process could be invoked from a mobile channel. The same applies to services, applications, information and servers.

This will make it possible to analyze the existing portfolio of processes, applications, information and servers to verify their readiness and maturity for mobile enterprise.

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3. Mobile specifics and mobile strategy

3.1 Mobiles usages

Basically, mobile applications, whether native, mobile web or hybrid, are made to meet the needs of users that are primarily:

- To be informed: by searching for information on a search engine, browsing websites, reading news or consulting a directory;
- To communicate: through voice, text or video exchange;
- To save and store documentary or multimedia content;
- To collaborate: through sharing documents and media content or accessing social networks;
- To Learn: through reading an ebook or using an e-learning application;
- To supervise or control remotely: as being notified of special events from an information system or remote video surveillance;
- To access or receive a professional or institutional service as checking a bank balance or to apply to a public administration service;
- To perform e-commerce transaction: through purchasing and making sales with payment features;
- To work remotely by accessing the company resources and the information systems;
- To entertain: through music, games and movies.

These needs, when they are combined with a situation, habits or preferences of usage (information) or user behavior or external events, are called **mobile usage**

3.2 Mobile capabilities

New technological capabilities of mobile devices offer more levers of innovation and opportunities to impact the company's business. Mobile devices are now equipped with a set of capabilities like communication features (Voice, SMS / MMS, Email), Internet access for browsing and cloud services and information system access, input capabilities (keyboard, touch screen, voice recognition, camera) and display (text, image, video) and capabilities related to internal and external sensors (GPS Geolocation, Accelerometer, gyro, proximity ... etc.). These capabilities are classified and summarized in the technical reference model proposed in section 5. We will see in the near future devices equipped with chemical sensors that can be used, for example, to assess the freshness of food and an integrated 3D camera that can be used to control the movements.

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Mobile solutions have, also, brought new opportunities to improve employees' productivity and efficiency of business processes once the capabilities of the mobile device are combined with external information systems of the companies with and capabilities existing in the cloud. However, companies' information systems must, first, demonstrate an openness and performance to be able to interact with mobile applications while insuring security.

3.3 Mobile Context

The concept of 'context' of the mobile user is very important to understand the value of mobility in the transformation of the company into the digital age. Several definitions have been proposed by [1] concluded that by its own definition "The context is a set of environmental conditions and preferences that either determine the behavior of the application or that involves an interesting application event for the user." Several definitions bring out some classifications such as the one given by Forrester [2] through the following three elements:

- The Situation: which can be characterized by the current time, location, altitude, environmental conditions, speed, etc..
- The Preferences: built by the previous decisions taken by the user and shared in the application or in social networks
- Attitude: through feelings and emotions inferred from user actions

Another definition of [3] distinguishes the computer context, user context and physical context.

Retrieving the context of the user has become easier thanks to the integration, in devices, of new software features and electronic components such as camera, GPS, accelerometer, sensors, NFC (Near Field Communications) …etc.

We believe that the context is none other than "the combination of a particular usage (situation / relationship / behavior) of the user with a device capacity". This definition introduces the link between the environment and the user need and the device capabilities. We can classify the context as a combination of three aspects:

- Informational context: situation and environmental conditions
- Organizational or structural context: relationships, contacts, networks
- Behavioral context: attitude, preferences and reactions3. Tables, Figures and Equations

3.4 Mobile strategy definition

In the last three years, mobile has become an important topic in business. Beyond its public use, we hear more and more of the mobile terminal as the future (Post-PC era, as a privileged communication channel with external stakeholders (customers, suppliers, partners) and internal stakeholders (employees, managers, shareholders) or as a tool to support the company's business processes.

These changes imply a need to define the company's mobile strategy in line with its overall strategy while taking into consideration the characteristics and constraints of mobiles environments.

The classical approach is to consider mobile applications as part of the Information System and integrate them into the process of IS strategic planning. This approach may be appropriate when the mobile is none other than an access channel to the IS and will apply more for alignment purposes than in the impact logic. The other disadvantage of this approach is that it does not take into account the specificities of mobile development, mobile projects and mobile use.

4. Mobile Strategic Planning Methodology

4.1 Overview

Following on our work of defining a methodology for IS strategic planning described in [16] and [17], we took advantage of the proposed approach that is based on the Enterprise Architecture to define a specific methodology the mobile with an adapted metamodel and taking into account the following elements:

- A lightweight approach adapted to the time constraint usually related to the definition of a mobile strategy
- An iterative and incremental approach to take into account the progressive character and the maturation process of a company to move to mobile. We also plan as a future work to define a maturity model for enterprise mobility.
- An approach that is inspired from a global Framework, which is the TOGAF framework [7] which allows to enrich the Framework and extend the methodology if necessary.
- A pragmatic approach supported by methodological techniques as will be presented in the next section.

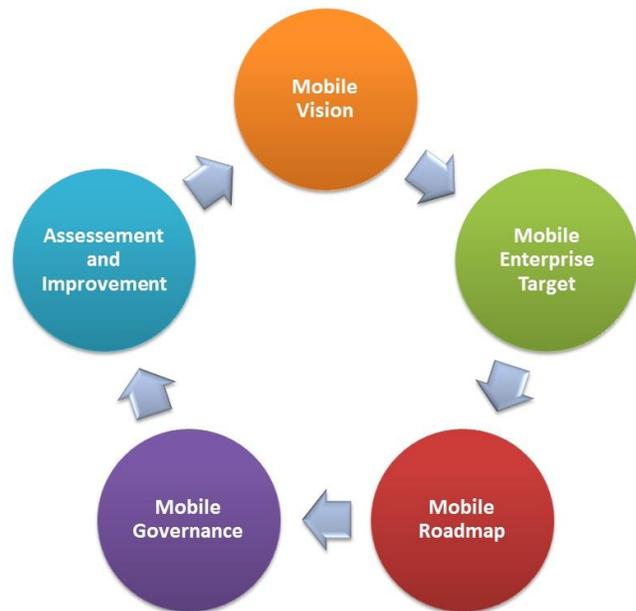The proposed methodology called VERGA consists of five phases:

Fig. 1. Mobile Stratgic Planning methodology : VERGA

- **Mobile Vision:** The objective in this phase is to define the strategic objectives of mobility and the Mobile Vision aligned with the strategic business and IT objectives of the company.
- **Mobile Enterprise Target:** In this phase we define the target processes and Information Systems to support the vision.
- **Mobile Roadmap:** This phase aim at defining the action plans necessary to move from the current state to the mobile enterprise target
- **Mobile Governance**: This phase make it possible to set up the organization, processes and tools, and other activities necessary to deploy, manage and maintain mobile initiatives
- **Assessement and Improvement**: To ensure continuous improvement of mobility, we need to assess regularly the needs and capabilities and make evolve the architecture while monitoring KPIs and usage.

4.2 Detailed description

The following table describes more in detail these phases :

Phase	Activities
Mobile Vision	As-is situation evaluation
	Maturity Assessement
	Defining the mobile vision in terms of :
	- strategic objectives,
	- business requirements,
	- target users and devices

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		users' needs,
		Mobile value chain
	Defining the existing capabilities and resources :	
		Business capabilities
		Mobile terminal capabilities
		IS capabilities
		Cloud capabilities
	Mobile principles and guidelines	
	Benchmark with similar organizations	
	KPIs to assess mobile initiatives	
Mobile Enterprise Target	This phase describes the target situation pursued by the enterprise based on the vision defined earlier :	
	User experience: Define principles of user experience and ergonomics that are coherent throughout the enterprise. This should be based on element of the vision (target users, usages and mobile principles)	
	Business View: identify business processes where mobility could have a benefit. Sometimes the mobile integration could imply the creation of new business activities or organization roles. The basic tool for this task is the detailed view of the Mobile Value Chain.	
	IS View: The aim here is to transform the need for automation in one or more process where mobility is introduced in one or more applications using databases and flows. Tools that can be used are:	
		IS Mobile mapping
		Mobile application reference model
	Technological View: identify the types of mobile devices and technologies to use. The tool can be used is the "Mobile Technical Reference Model". It is also necessary here to identify new needs in terms of hardware and software infrastructure to cope with security, performance and distribution challenges introduced by mobile applications. For example, it is sometimes necessary to acquire Mobile Device Management (MDM) software	
Mobile Roadmap	Short-term action plan	
	- Opportunities solution	
	- Capitalizing on the existing IS and especially web applications	
	- Preparation of existing IS application (services exposition)	
	Projects Plan	
	- Detailed mobile projects (initiatives)	
	- Prioritization	
	- Dependencies between mobile projects	

	- Dependencies with IT projects
Mobile Gouvernance	Definition of actors, roles and processes
	Adding mobility requirement and constraints to projects management processes
	Definition of governance of mobile security
	Mobile developement industrialization
	Organizational change management
	Communication Plan
Assessement and Improvement	Tracking and monitoring of mobile use
	Tracking KPIs
	Maintenance and evolution of mobile solutions

5. Methodological tools and techniques

The activities described above should be supported by some tools and techniques. Below, we will outline the « Mobile Vision Cube », a tool to set the Mobile Enterprise guidelines in the "Mobile Enterprise Vision" phase. Some reference models dedicated for the "Target Mobile Enterprise" phase are outlined later.

5.1 Mobile Vision Cube

The cube suggested is a representation of the three key parameters, when combined; we can identify mobility initiatives, mobile applications or mobile application families. The first parameter is the "User Need", the second is the enterprise "Value Chain" and the third is the "Device and Information System Capabilities".
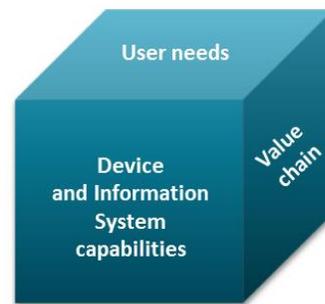

Fig. 2. Mobile Vision Cube

Mobility is, of course, introduced as an answer to one or many user needs. These users could be customers, employees or partners. This answer to user need is necessarily given within one of the enterprise value chain activities.
On the other side, mobile devices capabilities, the enterprise information system or Cloud capabilities could bring rich technology solutions to mobile use.

To illustrate the use of the Mobile Vision Cube for an insurance company, an Insurance Claim mobile application is based on the combination of:

- A user need which is making an insurance claim quickly;
- The activity of "Insurance Claim Management" which is one of the most important insurance companies value chain activities.
- Capabilities of mobile devices like the feature of tacking photos with the mobile camera. The application should be, also, connected to the insurance company information system providing services of an insurance claim management system (IS capabilities);

Another example could be a mobile application for geo-localizing gas stations:

- The user need is locating the nearest gas station
- The value chain activity concerned within a gas distribution is "Customer Relationship Management"

And the capabilities that could be used are: mobile geo-localization capability (using GPS feature for example), gas station location and information delivered by the information system and a map retrieved from the Cloud.

The third example is Business Intelligence mobile applications family:

- The user (company managers in this case) need could be to have quick access to business key performance indicators;
- The value chain activity concerned could be the company "Sales Management" activity;
- The device capability is the possibility of handling business information through a local database updated from the enterprise information system.

5.2 Mobile value chain

The business value chain is a tool that helps identifying high level business processes or finer level (level 2 or 3) processes that are likely to be equipped with mobility initiatives and typical mobile applications. The activities of the Customer Relationship Management, for example, can be equipped with applications "Mobile CRM". Performance monitoring activities can be provided with "Mobile Business Intelligence" applications.

This mobile value chain can be developed for a given business (eg, commercial enterprises) or a given industry activity (insurance sector for example).

Fig. 3. Mobile value chain

5.3 Mobile Application reference model

The application reference model provides predefined mobile applications that can be implemented either at company's front-office domain or at the back-office one or in a in a transverse manner through the company.
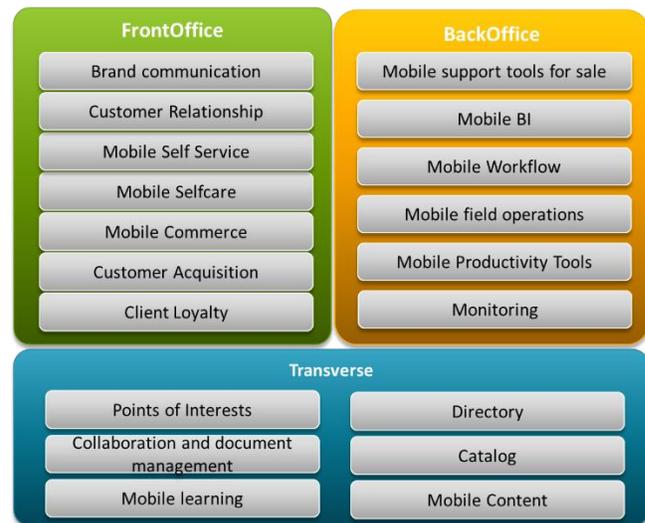

Fig. 4. Mobile application reference model

5.4 Mobile technical reference model

The mobile technical reference model lists a catalog of technological capabilities offered by mobile devices such as:

• The **sensors** (GPS, camera, accelerometer, etc.).

• **Standard applications** (Calendar, Contacts, Notification, etc.).

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- **Entries** (touchscreen, keyboard input, voice recognition, etc.).
- Means of **communication** (voice call, sending SMS / MMS, sending email, etc.).
- **Outputs** (Text display, image and video display, sound, etc.).
- Means of **storage** (disk storage, memory storage, etc.).
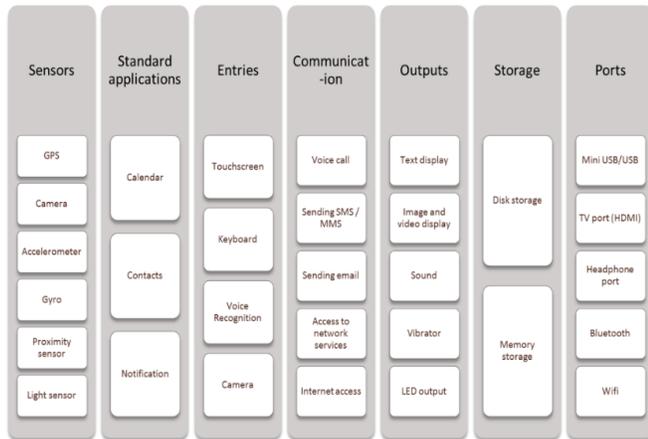- **Ports** (USB / Mini USB, TV output, Bluetooth, etc.).

Fig. 5. M**obile technical reference model**

6. Conclusion and future work

The methodology that has been proposed in this paper is inspired by the methodology TOGAF ADM while adding the specificities of mobile, lightweight appearance, pragmatic and progressive adapted to the requirements of business competitiveness. It is supported by three methodological tools and techniques to ensure a rapid and effective deployment of companies of different sizes and activities.

Methodological techniques (including models of application and technical references) that have been introduced are independently an extension and enhancement of existing architecture frameworks such as TOGAF to support the mobility aspects.

The methodology and the media are an important contribution in the mobile world that is often characterized by opportunism initiatives and time constraints imply a lack of organization and structure.

The methodology can be enriched by other methodological tools and techniques particularly for the phases Roadmap and Governance. It is also possible to define a maturity model for enterprise mobility that will define the content of VERGA cycle depending on the maturity of the company.

It also plans to enhance the metamodel that we have defined in [17] to cover mobility aspect.

Références

[1] Chen G. and Kotz D. A Survey of Context-Aware Mobile Computing Research. Technical Report TR2000-381, Dartmouth Computer Science, November, 2000

[2] Ask J. The Future Of Mobile Experiences Is Context, Forrester Report, October 2011

[3] Schilit B. Adams N. Want R., Context-aware computing applications. In Proceedings of IEEE Workshop on Mobile Computing Systems and Applications, pages 85-90, Santa Cruz, California, December 1994. IEEE Computer Society Press.

[4] Chandler, Alfred A., Jr. (1962), Strategy and Structure: Chapters in the History ofAmerican Industrial Enterprise, The MIT Press, Cambridge, MA

[5] Porter, M. E. (1985). Competitive Advantage: Creating and Sustaining Superior Performance, Collier Macmillan, New York, N.Y.

[6] Pant S., Hsu C.: Strategic Information Systems Planning: A Review, 1995 Information Resources Management Association International Conference.

[7] The Open Group .: "TOGAF as an Enterprise Architecture Framework", http://www.opengroup.org/architecture/togaf8-doc/arch/

[8] Sessions R. : "A Comparison of the Top Four Enterprise-Architecture Methodologies", http://msdn.microsoft.com/en-us/library/bb466232.aspx (2007)

[9] Schekkerman J. : Trends in Enterprise Architecture 2005: How are Organizations Progressing?

[10] Arnoldo C. Hax (1996), "Strategy Concept and Process: A Pragmatic Approach", Barnes and Noble, bn.com

[11] Lederer, A. L. and Sethi, V. (1988). The Implementation of Information Systems Planning Methodologies, MIS Quarterly, September 1988, 445-461.

[12] Vitale, M., Ives, B. and Beath, C. (1986), "Identifying Strategic Information Systems," Proc. 7th Int'l Conf. Inf. Sys., San Diego, December 1986, pp. 265-276.

[13] CCTA (1999). IS Strategy: process and products, Format Publishing Limited, Norwich.

[14] Boar, B. (2001). The Art of Strategic Planning for Information Technology, John Wiley and Sons, New York, NY.

[15] Clevenger N., iPad in the Enterprise: Developing and Deploying Business Applications, John Wiley & Sons, 2011

[16] Lakhdissi M, Bounabat B (2011). "Toward a novel methodology for IT Strategic Planning". Proceeding of ICIME 2011, p 277-287, , Toronto Canada, ISBN: 97-1-906638-98-6, April 2011

[17] Lakhdissi M, Bounabat B (2011). "A new content metamodel for IS Strategic Planning with a tool implementation" International Jounal of Computer Science Issues(IJCSI) Volume 8 Issue 8, Mars 2012