ANALYSING BUSINESS MODELS FOR THE OPEN SOURCE INDUSTRY: A RESEARCH PROPOSAL

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Introduction

Open Source (OS) is nowadays a strategy for software development. Some companies started to exploit OS based strategies in order to benefit from users' contributions or to prevent the creation of industry standards. As a result we have seen, in recent years, rise and falls of OS based Business Models (BMs) and Open BMs in general, are seen as the new frontier for innovation (Chesbrough 2007). The market, on its side, seems to reward companies that succeeds in clearly define their OS Business Model (BM), indicating how they will generate value in the near future (Alexy 2008).

Using another point of view, BMs related topics caught much attention both in scientific literature and in business practice (Alt and Zimmermann 2001): 27% of the Fortune 500 firms cited this term in their Annual Report in 2005 (Shafer et al. 2005). The term BM rose to prominence at the onset of the new economy and it was firstly referred to start-ups and then used to refer to every kind of organization. BMs related concepts were analysed in many research contributions, with different methodologies and objectives (Pateli and Giaglis 2004, Gordijn et al. 2005). As a result, research on BMs is as a fragmented area (Tikkanen et al. 2005), where authors even fail to recognize a common definition. In order to overcome these problems, recent contributions in this area tried to summarize the existing literature defining trends for BMs research as well as frameworks (Pateli and Giaglis 2003), classifications (Timmers 1998), taxonomies (Bienstock et al 2002, Rappa 2001, Weill and Vitale 2001) and ontologies (Gordijn and Tan 2005, Osterwalder et al. 2005, Shafer et al. 2005).

Back to the OS software, available research on OS BMs seems not to be aware of the peculiarities of the BM concept. Researchers focuses, until now, on licence strategies or other topics only, without applying established methodologies to analyse OS BMs.

This paper introduces a research proposal aiming at analysing OS BMs using established methodologies available in IS management literature. The rest of the paper is as follows: the next paragraph will identify the theoretical foundations of the proposed research, afterwards the research propositions and the methodology adopted will be described.

Theoretical Foundations

This paragraph is divided in two sub-paragraph: the first will draw the picture illustrating the actual state of research on BMs, while the second will focus specifically on research on OS BMs. Together these two paragraphs forms the base for the theoretical foundation of the proposed research.

Main topics in Business Models research

In the introduction research on BM has been presented as a multidisciplinary context. The common trait laying beyond this area of research is the idea of identifying viable solutions to get value out of a technology (usually an ICT). BMs, as objects of study, have been analysed by many disciplines (Braccini et al. 2008). Anyhow many authors writing on this topic fail to recognize the multidisciplinary aspects of this research field and prefer to start from scratch instead of relying on existing literature (Shafer et al. 2005). Authors usually do not share common theoretical backgrounds and sometime produce incompatible and mutually exclusive works (Hedman and Kalling 2003, Pateli and Giaglis 2003, Pateli and Giaglis 2004). The very term "Business Model" is used to indicate different aspects of the same phenomenon: some authors talk about BMs referring just to a part of what it means to others (Linder and Cantrell 2000). There are many definitions of "Business Model", and they vary in structure and contents. The following examples show the wide range of existing definitions:

- "*the organization's core logic for creating value*" (Linder and Cantrell 2000);
- "*a story that explains how an enterprise works*" (Magretta 2002);
- "*the way we make money*" (Bienstock et al. 2002);
- "*an architecture for the product, service and information flows, including the various business actors and their roles; a description of the potential benefits for the various business actors and a description of the sources of revenues*" (Timmers 1998);
- "*a clearly stated plan for adding economic value by applying know-how to a set of resources in order to create a marketable product or servic*e" (Miles et al. 2000);
- "*a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream, and the logistical stream*" (Mahadevan 2000).

In general, a BM refers to the way an organization can gather value, usually out of a communication or information processing technology.

Even if it may seems so, research on BMs is not a totally scattered field of interest as most relevant papers do actually share common ontological and epistemological approaches (Braccini and

Spagnoletti 2008). Furthermore, in order to overcome problems connected to the interoperability among available works, recent contributions try to summarize the existing literature defining frameworks (Pateli and Giaglis 2003), classifications (Timmers 1998), taxonomies (Bienstock et al. 2002, Rappa 2001, Weill and Vitale 2001) and ontologies (Gordijn and Tan 2005, Osterwalder et al. 2005, Shafer et al. 2005).

The adoption of an ontology-based approach in research on BMs aims at using this tool for the representation and exchange of knowledge (Guarino, 1998; Fensel, 2001), in order to define a shareable conceptualization of the term. In this research field, ontology-based approaches produced two different contributions: the Business Model Ontology (Osterwalder, 2004) and the e3-Value Ontology (Gordijn and Tan, 2005; Gordijn *et al.*, 2006). These ontologies define a conceptualization of BM from two different points of view. While the Business Model Ontology focuses more on the internal structure of the BM (and of the organization that runs it) and aims at defining a common language among interested subjects, the e3-Value Ontology deals with the formal representations of value exchange among different subjects in an organization or a network. Authors took into account interoperability issues between the two approaches (Gordijn *et al.*, 2005). The citations (calculated using Google Scholar) show that the Business Model Ontology is the most cited. According to this ontology, a BM is defined as: "*a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic for earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams*" (Osterwalder et al. 2005).

Open Source Business Models

There are few research contributions in the BM area of interest that investigate OS BMs. If research on BM is defined as the set of contributions published in peer reviewed journal citing the term "Business Model" in the title and in the abstract (Braccini and Spagnoletti 2008), there is only one research paper focusing on OS (Bonaccorsi et al. 2002). Positioned in the area of interest defined in the previous paragraph, it should considered among isolationists contributions, or better to say, among those that do not perceive the fragmented nature of the BM research area and do not recognize the need to provide an exact definition and solid theoretical foundations for the term.

Anyhow, interest on OS BMs is high. Sometimes entrepreneurs find difficulties in making profit with OS (Sharma et al. 2002): the opportunity to identify potential BMs that enable firms to take advantage of OS software is appealing for businesses (Cusumano 2004). The origins of the interest in OS BMs can be traced back to the success of the Linux operating system followed by the first

attempts to commercialize it (Hemphill 2006). The interest is mainly connected to the tentative to define available (or viable) BMs for OS software. The European Union funded some projects on OS that, among other topics, cover the area of Business Modelling too (ie: Qualipso).

Starting from the assumption that not each and every BM is equal in its capacity to create value (Watson et al. 2008), research contributions defined several typologies or taxonomies of available (or viable) OS BMs. All the proposed classification vary in contents and structure: some of them are cited in the following paragraphs.

In the attempt to define a taxonomy for Open and Closed Source Software Industry BMs, Hemphill (2006) identifies 8 BMs:

- CD software seller;
- Service support sellers;
- Loss leaders;
- Widget frosting;
- Accessorizing;
- Brand Licensing;
- Software franchising.

Dickson (2006) links the success of an OS BM to the dimension of the user base. Under this perspective he identifies 5 major BMs:

- Support service provider;
- Reputation builder and cross seller;
- Accessory sale;
- Brand licensing;
- Competitive advantage seeker.

In (Watson et al. 2008) 5 categories of BMs for software development are defined moving from the extreme of Proprietary software development to the opposite of Open Communities. In the middle there are three hybrid models (Corporate Distribution, Sponsored OS, Second Generation OS).

There exist simpler classifications too, like for example the one given in (Krishnamurthy 2005), where there are only three fundamental models: Distributor, Software Producer (both GPL and non GPL), and Third Party Service Provider.

Recent work in European Union funded research projects produced two further classifications. The FLOSS Metrics Project produced a taxonomy adapted to the recent developments of the markets defined as follows (Daffara 2008):

- Externally funded venture:
  - Public Funding;
  - Needed Improvement Funding;

- o Indirect Funding;
- Internally Funded or Revenue Based;
    - o "Best Knowledge Here" without constraints:
    - o "Best Knowledge here" with constraints;
    - o "Best Code Here" without constraints;
    - o "Best Code Here" with constraints;
    - o "Special" license.

Finally the Qualipso project proposed another typology of OS BMs (Qualipso 2008):

- Independent Software Vendor BM;
- Ecosystem Enabler BM;
- Software as a Service Vendor BM;
- Service Provider BM;
- Combination of OS Software Components with Hardware;
- Brand Selling;
- Advertisement;
- Global fee redistributed to authors.

Interpreting available research on OS BMs using the BM theoretical perspective given in previous paragraph two things should be noticed. First of all, all the classifications/typologies/taxonomies available just describe a BM using a Macro definition (Braccini et al. 2008). Plus, none of the established methodologies available for the description and the analysis of BM has ever been applied to the OS context. As a result proposed classifications/typologies/taxonomies are highly incompatible and poorly interoperable and may lead to confusion. There is the risk to use different names to describe the same thing or the same name to describe different things. All these aspect reduces the usability and the value of research on OS BM.

Research Propositions and Methodology

The theoretical foundations of the present research proposal illustrate the opportunity to investigate OS BM using established methodologies available in BMs literature.

Under this perspective the aim is to analyse OS BMs using an ontology based conceptualization (the Business Model Ontology to study the BM internals and the e3-value Ontology to describe value flows among involved subjects). The propositions beyond this research are the following:

- increase knowledge on OS BMs;
- increase knowledge on OS BMs internals;
- derive a shareable taxonomy of OS BMs;
- increase knowledge on methodology to support BMs analysis using an ontology based

approach;

- increase knowledge on methodology to support BM analysis using a unique ontology based approach, granting interoperability among the two most cited approaches in the field.

In order to achieve such results a substantial work on literature and on the field is necessary. First of all, a deep analysis of available literature on OS BM using the proposed ontology based approach will help in identifying which areas of the internal structure of a BM have gained more attention by available research and which have been left out. The next step will be the analysis of BMs of companies working in the OS sector. A possible sample of analysis could be composed by all the Italian companies enlisted in the Java Open Business Open Source map (containing actually data for 211 companies). Data publicly available on the Java Open Business map will be integrated by data gathered with interviews or surveys with the final subjects.

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