



# **The Strategic Management of Institutions for Value Creation**

## **A Study of Hybrid Models for Software Development**

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# AIMS

- Contribute to our knowledge of how institutions influence the dynamic processes carried out by heterogeneous agents that operate under their influence
- See if firms can intentionally “manage” institutions to better their competitive position by enhancing their capacity to innovate



# Institutions and views of value creation processes

**Schumpeterian linear view**



**Producer centered**



Typical IPRs stimulate value creation by assuring value appropriation from innovations



**Interactive, circular view and “sticky” knowledge**



Users/outsideers can be active creators



**Open innovation models**



Typical IPRs hinder open value creation processes



# Research Questions

- **Can firms intentionally create and strategically manage institutional mechanisms to access and leverage sources of creativity which are dispersed in their external environment?**
- **If so, what are the potential advantages and possible problems tied to these “strategic tools”?**

⇒ Implies demonstrating first of all that: The way institutional contexts are designed DOES influence the value creation process and the results obtained



# Theoretical framework

Methodological basis: **Austrian Process View**

Conceptual categories drawn from:

- **Studies on creativity and entrepreneurship**
- **Penrose's distinction between productive possibilities and productive opportunities**
- **The neo-institutional approach in economics.**



# Linking individual creativity to value creation performances

- **Micro level – individuals, their values, beliefs, knowledge and motivations**
- **Meso level – institutional context, i.e. the structure within which individual behaviors and interactions occur**
- **Macro level – economic organizations and their value creation performances**

# Criteria for the analysis of the influence institutional contexts exert on value creation processes



Penrose (1959): “Productive opportunities” are those resource combinations which are:

Perceived

Accessible

Motivated



The combined presence  
of these conditions is  
necessary for value  
creation to take place



- The way in which institutions influence these dimensions systematically directs individual efforts underlying the value creation processes which occur and the outcomes obtained within them



# Why look at the software industry?

- 1. Value creation is of paramount importance for firm survival and success**
- 2. *Software is developed according to different competing models, each of which possesses a distinct institutional setting***
- 3. *Firms are experimenting with the strategic design and management of institutions to leverage creativity dispersed in their external environment***



# The “pure” development models

**Closed producer-centered model** – occurs within commercial soft (or soft and hard)ware firms and rests on the definition of institutional mechanisms which consent high levels of value appropriation

**Open user-centered model** – occurs in open source communities or foundations and rests on institutional mechanisms which, by stimulating high levels of knowledge communication and open social interaction, facilitate value creation BUT, on the other hand, do not allow high levels of value appropriation



# The process followed to analyze the pure models

Method: Comparative analysis of “ideal types”

**Describe the distinctive institutional traits**



**Influence of institutional traits on the three determinants of innovation processes**



**Influence on main characteristics of development process and on software obtained**



# Distinctive institutional traits of the “pure” models

Closed producer-centered model	Open user-centered model
<p><b><u>Formal Institutions -</u></b></p> <ul style="list-style-type: none"><li>• IPR's: protect firm code from imitation, replication &amp; free riding.</li><li>• Programmer contracts: code belongs to the firm; secrecy on work conducted within the firm.</li></ul> <p><b><u>Informal Institutions -</u></b></p> <ul style="list-style-type: none"><li>• Informal norms of work organization similar to manufacturing firms, but some “hacker culture” is mimicked.</li></ul>	<p><b><u>Formal Institutions –</u></b></p> <ul style="list-style-type: none"><li>• IPR's used to: (a) keep code open and transparent (b) maximize circulation on the web (c) protect reputation and identity of sponsor community or foundation</li><li>• Single programmers maintain IPRs on code they write</li><li>• Project responsibility is allocated by meritocracy in bottom-up process</li></ul> <p><b><u>Informal Institutions – “Hacker Culture”</u></b></p> <ul style="list-style-type: none"><li>• Individual meritocracy, autonomy and capacity to resolve problems</li><li>• Reputation based on the quality of the artifacts contributed to common work</li><li>• “Gift culture”</li></ul>

# Influence of main institutional traits on the determinants of firm development



Closed producer-centered model	Open user centered-model
<p><u>Perception</u></p> <ul style="list-style-type: none"> <li>• Top-down</li> <li>• Objective is market success</li> <li>• Target markets are large segments or protected niches</li> </ul> <p><u>Accessibility</u></p> <ul style="list-style-type: none"> <li>• High barriers to accessibility by IPR's</li> <li>• Risk of infringement on other's patents</li> <li>• Low accessibility hinders new perceptions</li> </ul> <p><u>Motivation</u></p> <ul style="list-style-type: none"> <li>• Single programmers: economic</li> <li>• Firm: economic</li> </ul>	<p><u>Perception</u></p> <ul style="list-style-type: none"> <li>• Contributors not pre-determined – Leverages disseminated knowledge</li> <li>• Knowledge used is not only technical but of time and place</li> <li>• Self selection of tasks – efficient allocation of programming resources</li> <li>• Variety of time-space settings facilitates bug detection</li> </ul> <p><u>Accessibility</u></p> <ul style="list-style-type: none"> <li>• IPRs used to eliminate all barriers to access</li> <li>• Licenses create interfaces between communities enhancing climate of trust</li> <li>• Spurs new perceptions</li> </ul> <p><u>Motivation</u></p> <ul style="list-style-type: none"> <li>• Internal motivations –(i) necessity for software (ii) fun/interest (iii) to learn</li> <li>• External motivations –(i) reputation building in the community (used also on labor market (debated))</li> </ul>



# The closed producer-centered model

- Characteristic of production model

- **Market oriented production**
  
- **Integrated organizations for the production of different soft (and hard)ware**
  
- **\*Organizations which possess marketing service capacities**
  
- **\*Brand reputation**
  
- **\*Workforce paid**

- Characteristic of software

- **Good user friendly systems – can relate to less knowledgeable users**
  
- **Capacity to offer integrated “turnkey” solutions with many compatible complements**
  
- **Ability to offer services correlated to the software: support, consultancy, training**
  
- **Reassurance for less knowledgeable users**
  
- **Software that performs what the market values, not just what is “fun” or “interesting” to programme**



# The open user-centered model

## Characteristic of production model

\*Code developed by programmers for software they are directly interested in

\*Wide peer-review

\*Programmers who are not paid

\*Source code is open

## Characteristic of software

Core software made for other programmers

High reliability, quality and stability

Low/No cost to acquire software

Symmetry between all agents: programmers and users - implies the software is: futureproof; customizable; gives no lock-in; acceptable as a common standard for all parties).



# The hybrid model

## Cases -

- Soft and hardware firms:
  - **IBM's** WebSphere products;
  - **Apple's** Darwin project;
  - **SunMicrosystems's** OpenOffice, Solaris, Java
- Software firms:
  - **Netscape's** Mozilla project;
  - **Sap's** ERM products;
  - **Oracle's** data base products.

## Common traits –

↘ **DIFFICULTY TO KEEP UP INNOVATION VS COMPETITORS**

↘ **POSSESSION OF MORE THAN ONE STRATEGIC RESOURCE OR COMPETENCE**

# Problems faced when adopting the hybrid model



## 1. Technical Issues –

- What to “donate” on the web
- Modularity
- Frequency of releases

## 2. Formal Institutions – Licenses:

- Partly open or open partly

## 3. Informal Institutions – Creating an active community:

- Incentives, communication & coordination
- Overcome mistrust
- Distribution of authority and responsibility
- Internal culture open to external creative contributions



# Results of hybrid models

## ***Potential benefits:***

- **Extend user base**
- **Increase quality, reliability and stability of software**
- **Perception of new development paths**
- **Increase integration and portability of software**
- **Increase independence from software firms -hardware firms**
- **Creation of a communication channel with the OS community**

## ***Potential Pitfalls:***

- **Loss/substantial reduction of revenues from selling the code**
- **Loss of competitive advantage: imitation facilitated**
- **Loss of control over future development of the code**



# Conclusions

- Software development shows firms are managing institutions strategically with alternate success.
- Firms are not creating entirely new contexts; they are bridging and melding institutional context which already exist.
- To use institutional “tools” successfully, firms must take the **systemic nature of institutional contexts** seriously:
  - E.g.
    - Importance of informal rules to create an active community
    - Balancing value creation and value appropriation issues



# Contributions to theory building

- Linking Institutional design to the originating forces of innovation (individual intuition, creativity and discovery) by analyzing their influence on the three determinants of which innovation opportunities are grasped: Perception, Accessibility and Motivation
- Seeing single firms acting directly on institutions not through pressure on public agents nor by self-regulating industries, but by defining the rules that guide interaction with a micro-environment which can beneficially contribute to it's capacity to innovate vis à vis competitors:

.... "INSTITUTIONS AND FIRM SELF-REGULATION"





# Re-establishing the value creation vs value appropriation balance

## Dynamic Value Creation



Dynamic process of social interaction & communication to leverage dispersed knowledge



Surrender traditional sources that allow value appropriation

## ⇒ Dynamic Value Appropriation



Possession and protection from imitation\replication of complementary specialized assets



Change business model in search of alternative sources of value appropriation