Dynamic capabilities for managing emerging technologies

The case of emerging telecommunication technologies

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The business school that thinks and lives in the future
AGENDA

1. Telecommunication industry landscape
2. Emerging technologies-traits & consequences
3. Emerging technologies and dynamic capabilities
4. Research objectives and design
5. Q&A
TELECOMMUNICATION INDUSTRY LANDSCAPE

System and component suppliers → Telecommunication Vendors → Operators → End users

- Service and content providers
- Regulatory and standardization
- Handset and computer makers

4G telecommunication technology: targeting 100Mbps-1Gbps data rate
EMERGING TECHNOLOGIES - TRAITS

- **Recent or new** to the entire industry (Ahuja & Lampert, 2001)
- Potential to **create or transform industries** (Day and Schoemaker, 2000)
- Having **substantial effect** on the business and social environment (Porter et al, 2002)
- **Still expanding knowledge base**
- **Still unknown** aspects about application to existing markets (Day and Schoemaker, 2000)
- Being developed through a **network of interacting companies** (Hamilton, 1985; van der Valk et al, 2010)
- **Competing technological trajectories** (Soares et al, 1997)
- Require **significant and sustained investments** before the payoff time (Soares et al, 1997)
- **Radical** (e.g. digital photography) or **evolutionary** (e.g. internet technologies) (Day and Schoemaker, 2000).
EMERGING TECHNOLOGIES - TRAITS

Technology
- Uncertain knowledge base
- Emergent architecture and standards
- Unknown functions

Infrastructure
- Formative value network (Suppliers, channels, etc)
- Emergent regulations and standards

Market
- Alteration in usage pattern
- Insufficient market knowledge

Industry
- Embryonic structure
- New entrants
- Emergent business models

Emerging Technology

(Day and Schoemaker, 2000)
ENVIRONMENTAL UNCERTAINTIES AND COMPLEXITIES IN MANAGING EMERGING TECHNOLOGIES

- Is it possible to rely merely on cognitive traits of individuals to overcome these challenges?
- "Organizational processes can be put in place inside enterprise to garner new technical information, tap developments in exogenous science, monitor customer needs and competitor activity, and shape new products and processes opportunities". (Teece, 2007)
DYNAMIC CAPABILITIES-DEFINITION

• “A dynamic capability is the firm’s potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base.”

Ilídio (January 2010)
Dynamic capabilities are the foundation of enterprise-level competitive advantage in regimes of rapid technological change.

(Teece, 2007)
Dynamic capabilities are the foundation of enterprise-level competitive advantage in regimes of rapid technological change.

(Teece, 2007; Helfat et al., 2007)
DYNAMIC CAPABILITIES - SENSING

Emerging technologies

Complexity

Uncertainty

Underlying processes, routines and organizational structure

Internal search
Access to external science & technology
Supplier & complementor innovation
Market and customer knowledge

Dynamic capabilities for sensing market opportunities
INTERNAL SEARCH

Number of accepted patents on 4G (Retrieved from ETSI IPR online database)
Published scientific papers on 4G per year (Retrieved from Compendex online database)
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**Ericsson, Intel Do HSPA MIDs**

OCTOBER 20, 2008 | Post a comment | Tweet | Share

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STOCKHOLM -- Ericsson (NASDAQ: ERIC) announced today that it is collaborating with Intel to bring HSPA mobile data solutions to Mobile Internet Devices (MIDs). Ericsson is thereby extending its 3G mobile broadband technology from notebooks to a range of pocketable devices with various purposes.
MARKET AND CONSUMER KNOWLEDGE

- Processes to identify target market, segments, changing customer needs and customer innovation

GLOBAL SEGMENT DESCRIPTIONS
The Ericsson Group Global Consumer Segmentation Model
DYNAMIC CAPABILITIES - SEIZING

Emerging technologies

Complexity

Uncertainty

Underlying processes, routines and organizational structure

Technology selection and investment decisions

Product development process and organization

Business model

Network and alliance activities

Learning and knowledge creating activities

Dynamic capabilities for seizing market opportunities
Published scientific papers on competing 4G standards (2006-2010)
“Amid rapid adoption of smart phones in the Netherlands, KPN said consumers are using fewer SMS text messages and substituting voice calls for cheaper Internet-based calls. Business customer margins also are suffering amid competition.”
Number of allied mobile network operators for 4G technology (Derived from Yankee group (2010) intelligence report)
RESEARCH PURPOSE AND FRAMEWORK

- Relationship between Dynamic capabilities and performance in confrontation with emerging technologies
- Identification of the means by which firms develop the dynamic capabilities (Antecedents)
RESEARCH APPROACH

• Phase 1: Development of conceptual framework via a single in-depth case study

• Phase 2: Hypothesis development and Quantitative study on antecedents and consequences of dynamic capabilities
Thank You!