Business Modelling for Mobile Grid Scenarios

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Outline

- 1st Journey

  From Industry Age to Information Age

- 2nd Journey

  From Electronic Business to Mobile Grid Business

- 3rd Journey

  From Current Telecommunication Value Chain to a First Mobile Grid Business Model

Transformation:
From Industry to Information Age

[Winter 2003a]

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Accelerated Evolution of the Economy

- **2000 „Digital Econonomy"** according to Haertsch:
  … is global economy based on information and communication technology, leading from material to immaterial assets and enabling novel products, services, and form of organizations"

- **2001 „Internet Economy"** according to Wirtz:
  … is essentially digital-based economy using computer-based networking for global communication, interaction, and transactions.

E-Business: Hype & Decline

[Gartner]

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Information Age: Systematic Approach – Understand first

[Winter 2000] [Andersen Consulting 1999]

E-Business: Systematic Approach – Then act methodically

[Winter 2003a]

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E-Business

Starting Point: The Information Society

[Wirtz 2001, p. 6]

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Information society

- Electronic commerce
  Electronic support of buying and selling activities of goods and services via electronic networks
- Electronic collaboration
  Network-based, inter-active, intra- and/or inter-organizational collaboration
- Electronic communication
  gratuitous and nongratuitous provision and use of net-based and electronic communication platforms
- Electronic education
  Transfer of education services for third parties via electronic networks
- Electronic information
  Content and concept provision for third parties via electronic networks

[Wirtz 2001, p. 40]

Electronic Business

- Electronic Business is the initiation and partly or complete support, processing, and maintenance of service exchange processes via electronic networks.

- Electronic Business is the administration of conducting business via the Internet. This would include the buying and selling of goods and services, along with providing technical or customer support through the Internet. e-Business is a term often used in conjunction with e-commerce, but includes services in addition to the sale of goods.

[Wirtz 2001][Webopedia]

Electronic Business Concepts

[Staehler 2001]

Electronic Business Classification Criteria

Object	Value				
Actor	Individual	Company			Public authorities
Type of commodity offered	Material			Immaterial	
Transaction phase	Infor-mation	Nego-tiation	Clo-sing	Exe-cution	Adjust-ment
Distribution	Physical			Virtual	
Intensity	E-business as distribution channel			E-business as business model	

[Wirtz 2001]

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Electronic Business
Partner Relationships (Sample)

Customer side

Supplier side	Authorities, bodies, states	Company	End-consumer
	A2A	A2B	A2C
	B2A	B2B	B2C
	C2A	C2B	C2C
	Administration	Business	Consumer

[Wirtz 2001]

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Electronic Business Partner Relationships (Cardinalities)

[Schwarze, Schwarze 2001, p. 40]

Caption: S = supplier C =customer

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From Electronic Business to Mobile Grid Business

M-Business

Mobile Commerce & Mobile Business

- Every kind of economic activity based on electronic connections via mobile devices [Picot/Reichwald/Wigand 1996].

- M-commerce is the digital <u>initiation, negotiation, and/or processing of transactions</u> between economic subjects via mobile devices [Clement/Peters/Preiß 1999].

Mobile Business – Characteristics

- Mobility
  Mobile phone is mobile and can be used everywhere as far as there is some network connection (anywhere).
- Availability
  Only high availability enables the user to receive continuously current information (anytime)
- Identification
  All mobile phones with a SIM card of GSM standard assign unique user identification.
- Localisation
  Currently, network providers can recognize a mobile phone user's position with an exactness of about 100 metres.
- Package-based
  Thus, permanently online, "instant connectivity".

[Skiera 2000]

From E-Business to Mobile Grid Business

Grid Business

Cellular Model of Company Cooperation

[Faehnrich 2004]

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Virtual Companies Characteristics

- Virtual companies result from enterprise co-operations.
- Companies involved retain their economic and juristic independence (no joint ventures)
- Virtual companies purpose optimal resource usage.
- Virtual companies are open for any company that is able to a provide a needed resource.
- Virtual companies are dissolved after their purpose was accomplished.
- Virtual companies can co-operate horizontally or vertically.
- The strongest relationship issue between partners is confidence.

[Faehnrich 2004]

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From E-Business to Mobile Grid Business

Success Factors in Mobile Grid Business

How to succeed in Mobile Grid Business?

- Push away existing structures that are providing accordant services today, or
- Build new structures which will develop new business segments that can not be accessed in a different way.

- More detailed description given by Callon in the context of the competitive advantage of IT. Accordingly, positive contribution can come from
  - Efficiency measured by productivity (doing things better);
  - Effectiveness (doing better things including: what an organisation could never do before);
  - Competitive advantage (doing better and new things for the customer)

[Callon 1995]

Strategic Options for Potential Mobile Grid Business Participants

[Schwarze, Schwarze 2001, p. 50]

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Current Inter-organizational Telcommunication Value Chain

Component Producer	Subsystem Producer	Network Systems Producer	End Device Producer	Telco Network Operator	Telco Service Provider	Application Provider
• Semi-conductors • Optical fibres • Copper cables • Modular packaging systems • Electronic components • Electronic displays • Batteries	• Electric amplifiers • Optical amplifiers • Power supply • Multiplexers • Routers • Software modules • Air conditioning technology • Computers	• Switches • Billing systems • Transmission systems • Network management Systems • Mobile network systems	• Telephones • Fax machines • Modems • Answering machines • xDSL splitters • Least cost routers • PC cards • Mobile phones • Television/ radio receivers	• Intermediary grid-bound speech telephone networks • Intermediary mobile phone networks • IP networks • Further data networks • Cable distribution Networks (TV/radio)	• Network-leveled basic services (e. g. telephone connection) • Network-leveled added value services (e. g. voice box, phone call forwarding) • Application-leveled added value services (e. g. video on demand, Web hosting, sectoral data exchange)	• Search engines • Helpdesk systems (e. g. timetables) • finance applications (e. g. Trade in Securities) • Administration applications (e. g. applicant management) • Book entry systems • Online Shops/ Markets
• Corning • Data Modul • Infineon • Toshiba	• Ciena • Cisco • Juniper • Siemens	• Alcatel • Ericsson • Nortel • Siemens	• Motorola • Nokia • Philipps • Samsung	• BT Ignite • Deutsche Telekom • Level3 • Vodafone/ Arcor	• Debitel • Deutsche Telekom • Mox Telecom • Schlund	• Amazon • ebay • Lufthansa • Yahoo!

[Gerpott 2004]

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High Uncertainty in Prediciting Future Telco Value Chain

Highly dynamic business environment

(Vital) importance

Transaction atmosphere and frequency

Behaviour of actors

Uncertainty

Customer process

Complexity

Specificity

Complete process logic deregulation as "worst case" …

[Partly based on Heinrich 2002]

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Proposal of a Future Telco Value Network for an E-Learning Scenario

[Partly on Winter 2003b]

Process Logic Reengineering by Means of Economic Theories

Transaction cost theory and agency theory together predict that

- the higher the level of uncertainty surrounding the business context
- the greater the information asymmetry between resource exchangers,
- the greater the specificity of investment required for the economic activity in question,
- the more difficult it is to relate the marginal contribution of different resources to the final value, and
- the greater the conflict of interest between resource exchangers,
- the higher the likelihood of an integrated or consolidated value chain. That is, the more likely it will be that a greater proportion of the value adding-activities will be organized within a few firms.

[Venkataraman, Bodily 2003]

Serialization of the Mobile Grid Value Network

		Service Consumers														
		NEP	NO	NSP	GEP	LRP	GRP	GO	CP	SP	PIEP	DP	User	AP	PCP	PP
Service Offerers	NEP															
	NO															
	NSP															
	GEP															
	LRP															
	GRP															
	GO															
	CP															
	SP															
	PIEP															
	DP															
	User															
	AP															
	PCP															
	PP															

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The Serialized Mobile Grid Value Network

Caption

- Business via conventional BCI and Mobile Grid
- Business via Mobile Grid
- Business via conventional BCI
- Proposal for Business Partner Integration

Participants in the Value Network

Internal Value Chain

Information Flow

* Interaction with almost every role

Border of Business Collaboration via the Mobile Grid

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Common Business Model Attributes

Attribute	Freq.	Attribute	Freq.
Actors/Roles	64%	Actor relationships	18%
Enterprise Considerations	54%	Technology	18%
Finance/Business Volume	54%	Enterprise Unit Consider.	14%
Goods/Services	50%	External Communication	11%
Added Value	43%	Form of Organisation	11%
Abstraction/Aggregation	32%	Growth	11%
Competitive Environment	32%	Legal Aspects	11%
Strategy/Vision/Goal	29%	Resources (General)	11%
Benefit	25%	Enterprise Network	7%
Value Chain/Core Compet.	25%	Critical Success Factors	7%
Earnings	21%	Product Life Cycle	7%
Information (Flows)	21%	Control Mechanisms	4%
Processes/Procedure	21%		

[Scheer, Dellmann, Loos 2003]

“Traditional” E-Business Models

- (Cyber-)Store
- Aggregator
- Product manufacturer
- Functional outsourcer
- Broker
- Advertiser
- Information mediator
- Merchant
- Direct manufacturer
- Affiliate
- Community Provider
- Subscription Provider
- Utility Provider

[Sawhny, Bauer 2004]

Identification of the Right Business Model

- Limited knowledge on future
- Product development of telecommunication providers to be considered as industry secrets

- Approach
  1. Consideration of strategic decisions for each of the Mobile Grid value network participants as starting point
  2. Presupposition of clear customer orientation
  3. Presupposition of continuous validity of supply chain mechanisms
  4. Assurance of flexibility and business model re-configurability by clear business service orientation

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1. Consideration of Strategic Decisions

Two major strategies for enterprises of the internet economy and the information society respectively:

- Cost leadership by providing services at very low prices. Consequently, standardization and high-performance technologies are necessary;

- Differentiation in various fields:
  - Research and development (related to products and technologies),
  - Marketing mix,
  - Production,
  - Logistic.

[Porter 1980]

2. Clear Customer Orientation

- Customer process as starting point
- Identification of supporting action items in the areas of
  - Information logistic
  - Material logistic
  - Cash flow and peripherals
- Assignment of supporting business services

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2.A. Customer Orientation in the Material Logistic Context

Zoom

[Partly on Heinrich 2002]

2.B. Customer Orientation in the Cash Flow Context

[Partly on Heinrich 2002]

2.C. Customer Orientation in the Information Logistic Context

[Partly on Heinrich 2002]

3. Supply Chain Mechanisms

[Pine 1993]

3. Roles in the Supply Chain (1)

- Customer
  - Buyer and consumer of the final product.
  - Has the chance to express his specific needs and desires in order to get customized goods on demand.
  - Partner in the supply chain ("customer integration").
- Vendor
  - The organization that offers goods on the market is called vendor ("market maker"). Also selling and marketing focused enterprises with no production plant.
  - The real net output ratio is low but there is a high degree of branding activities.
- Configurator
  - Is an interface or intermediary between the vendor and the customers.
  - Necessary individualization data must be collected.
  - Customer's product requirements and the values of all product option parameters are identified.
  - Configuration system has to ensure that only valid and complete product specifications are approved for ordering.

[Dietrich, Kirn 2005]

3. Roles in the Supply Chain (2)

- Producer
  - Responsible for planning, coordination and execution of manufacturing processes.
  - Depending on the degree of vertical integration, production steps can be made in-house or substituted.
- Supplier
  - Provision of standardized or customized product components.
  - Establish of the "production network" with producers.
- Logistics Service Provider (LSP)
  - Task of product distribution
  - Interaction with other actors (i.e. supplier, producer, vendor)
  - Transport of the customized good from the producer to the customer.

[Dietrich, Kirn 2005]

3. Application of Supply Chain Mechanisms in an E-Health Scenario

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4. Service Orientation (1)

Area	Criteria	Description
Service Basics	Service name	Virtual emergency health record service
	Short service description	Collect available patient's records and determine emergency-relevant information
	Service goal(s)	Provide on-demand situation-specific patient's records
	Service charact.	Execution
Service Details	Service provider	Grid resource provider
		Supplier: patient record storage provider
	Service receiver	Logistics service provider
		LSP: Heart attack specialist, hospital
	Required resources	Communications infrastruct., mobile devices
	Min. service level	Available patient's records are provided
	Quality service level	Patient's records are presented by level of relevance

[Derived from Bieser 2004]

4. Service Orientation (2)

Area	Criteria	Description
Service Subord	Service Interfaces	
	Further Service Dependencies	User Management/Profile Management Service, Virtual Emergency Environment
	Critical Success Factors	Determination of relevance
Value Chain Details	Supply Chain Coverage	Configurator, Vendor, Producer, Supplier, Logistics Service Provider
	Cost Model	Transaction-fee
	Value Chain Earnings	Logistics Service Provider

[Derived from Bieser 2004]

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Early Business Model with Exchange of Proposed Service Results

[Woitsch et al. 2005]

Proposed Evaluation Criteria for Strategic Decisions

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Strategy Evaluation for Each Mobile Grid Value Network Participant

Network Technology Provision	Network Equipment Provider	CLS
	Network Operator	CLS
	Network Service Provider	CLS
Grid Technology Provision	Grid Equipment Provider	CLS
	Grid Solution Provider	CLS
	Grid Resource Provider	CLS
	Grid Operator	DFS
Content Provision	Content Provider	DFS
Solution Provision	Solution Provider	DFS
Access Provision	Access Provider	CLS
Extended Mobile Device Infrastructure Provision	Plug-in Equipment Provider	DFS
	Device Provider	DFS
	Local Resource Provider	CLS
Payment Provision	Payment Clearing Provider	CLS
	Payment Provider	CLS
Logistic Provision	Logistic Service Provider	CLS

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Summary

- Mobile Grid Business as a consequent development of electronic business
- Value network provided based on theoretical assumptions
- Business model framework proposed based on service, logistic, and customer process orientation
- High uncertainty regarding final business model for participants
- Next steps: Indicative Business Cases together with Industry Partners
- Privacy disclaimer …

Thank you!

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