Integrated Solutions and Organisational Transformation in Vestas

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Our background

- 2006-2010, Andy and Lars working at Innovation and Entrepreneurship Group, Imperial College Business School, Imperial College London

- Continue work on project-based suppliers and consultants in complex products and systems

- 2007-2010 research on Integrated Solutions in collaboration with IBM and BT

- 2006-2010 research on business model innovation in infrastructure industries (i.e. roads, water, and urban design)
Overview

1. Introduction to the concept of a business model

2. The integrated solutions business model

3. Core capabilities and organisational challenges
Change is the way the future invades our lives
(Alvin Toffler)

That’s what business models innovation is all about!
What does a model do?

• Provides means to describe and classify... businesses

• Acts as recipes for creative managers

• Serves as analogies to set novel models apart

• Operates as sites for scientific investigation

• Thus, business models are a strategic resource for managers!
The traditional view:

- Technology
- Product (+ service) development
- New processes/services (solutions)
Tell us about the most important innovations for **your organisation**
A business model explains value creation and capture

It is dynamic!
It can be innovated!

Business model innovation may contain innovation in the product domain as well as in processes, services and technology, markets, partners, etc.
Benefits cited by business model innovators

- Cost reduction
- Strategic flexibility
- Focus and specialization
- Rapidly exploit new market/product opportunities
- Share or reduce risk and capital investment
- Move from fixed to variable cost

A classic example: Business model innovation
What is a BM and where does the concept come from?

• Conceptual confusion
  • Transaction systems and revenue model - concerned with value creation and value capture through efficiency or novelty
  • Cognitive model…what business are we in

• Origin
  • Close association between Nasdaq stock market price index (ICT boom) and with a 1 year lag conceptual academic underpinnings in business and management journals (1996 – 2003)
  • A concept entering from practice into academia or vice versa?
Key elements of a business model

• A business model is a *conceptual* tool
  • set of elements and their relationships which jointly express the logic of business for a specific firm

• It focuses on the *value a firm offers* to one or several segments of customers

• Using its *technology and organisational design*:
  • activities and capabilities
  • network of partners for creating, marketing, and delivering this value and relationship capital

• Business objectives – to *generate profitable and sustainable revenue* streams
An alternative view: BM as performative representation

- Business models are narratives that convince stakeholders
- They are useful for typifying thus providing legitimacy
- BMs serve as recipes instructing operational action
- Interpretative flexibility regarding the notion:
  - Bad: promote individuals’ own agendas
  - Good: offers a room wide enough for meaningful interaction between practitioners and academics
Now, add considerations about sustainability to all components!
External forces
The integrated solutions business model
General trend: from products to services

• ‘Smart manufacturers are moving downstream [into services] for the very simple reason: that’s where the money is’ (Wise and Baumgartner, 1999)

• Services 25% of total revenues across manufacturing firms

• Rolls Royce services over 50%

• IBM services are over 60%
Servicing the installed base

Expenditure on services

Total annual cost US rail operations: $29 billion (1999)

Installed-base-to-new-product ratio:
- Trains (22:1)
- Civil aircraft (150:1)

Expenditure on new products

Rolling stock services
Freight car services
Train operations
Maintenance
Railway administration
Infrastructure

Total expenditure on services = 21x product costs
Our learning is from 10 multinational companies

- Over a decade of pioneering collaborative research, teaching and consulting
  - 2 large government funded research projects: 2000-2010
  - Over 200 interviews with CEO, CTO, Managing Directors, Project Managers, Bid Managers, Functional Heads (e.g. HR), etc.
  - Collaboration with leading scholars: e.g. Henry Chesbrough, Hass, Berkeley and Michael Cusumano, MIT
- Industrial collaborators:
Integrated solutions business model

• ‘A solution is an innovative combination of technology, products and services providing a high value unified response to a business [or government] customer’s needs’

• Selling products and services as integrated solutions that solve a customer’s business need
Example: Solutions for ‘train availability’

• London Underground: requests that 96 trains available each day over 20 years - 1995-2015
• Alstom Transport: designs and builds 106 trains - £429m contract

• Contracts paid according to length of delays and number of passengers held up
• Alstom builds a maintenance service business to delivery the project
Integrated solutions – new types of customer-focused projects

- Global outsourcing solutions (e.g. Cable & Wireless)
- Turnkey solutions (e.g. Ericsson, ABB)
- Design, Build, Operate (DBO)
- Design, Build, Finance, Operate (DBFO)
- PFI - Private Finance Initiative (e.g. UK defence, NHS procurement)
- PPP - Public Private Partnerships
- Integrated solutions (IBM)
The shift to integrated solutions

Upstream

- Raw materials
- Manufacture
- Systems integration
- Systems selling
- Manufacturer

Integrated solutions

Customer – vertically integrated business and/or government

Downstream

- Operational services
- Final service provision
- Final consumer

Added value

- Raw materials, intermediate goods, primary product manufacture
- Produce components and subsystems
- Design and integrate systems
- Operate, maintain and upgrade systems
- Use operational capacity to provide services to users
- Consumption of service by end-user
Integrated solutions: drivers and challenges

Drivers

• Customer outsourcing
• Attraction of higher-value services
• Liberalisation & privatisation
• Government procurement (PFI & PPP)

Organisational Challenges

1. New strategic focus in value stream
2. New capabilities
3. New organisational structures
4. Balancing innovation and productivity
5. Growing the business
Capabilities 1: Systems integration

Customer

Design and integrate hardware, software and services into functioning system

Systems integrator

Subsystem suppliers

Component suppliers

Parts suppliers
Types of systems integrator organisations

• **Single-vendor**
  - Product components sourced from in-house product divisions
  - Thales flight simulators – pure ‘system seller’

• **Multi-vendor – ‘the acid test of solutions provision’**
  - Components sourced from external suppliers
  
  **Service-based firms** – pure ‘systems integrators’
    - e.g. telecoms: Cable & Wireless ‘best-in-class’ products

  **Product-based firms**
    - e.g. railways: Alstom, Ericsson, IBM
### Increasing systems complexity

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Example</th>
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<tbody>
<tr>
<td>System</td>
<td>Single system - a common goal</td>
<td>Building system, air traffic control system, baggage handling system</td>
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| Subsystem or component | material, component, subsystem  
self-contained or within larger system | Development of a product, design of a service, Radio base station |
| System of systems | System or platform  
single system - a common goal | e.g. airport  
terminals, air traffic control, runways, baggage handling systems, connect road and rail networks, etc. |
| System | Systems with independent functions, but each with common goal               |                                  |

- **Systems with independent functions, but each with common goal**
- **System of systems**
- **System**
- **Subsystem or component**
Enabling a integrated solution approach:
Integrated solutions in a building

Integration

- Make energy visible
- Make systems work together

Efficient & productive:
- Measure and control energy, automate, provide relevant diagnosis
- Manage processes
- Make all the utilities of any Infrastructure more efficient

Reliable
- Prevent from power outage & quality variance

Safe
- Protect people and assets
- Transform and distribute power safely

Green:
- Make the connection of renewable energy sources easy, reliable and cost-effective
Schneider Electric’s move into integrated systems

**Level 1: PACKAGE**
Combination of product, equipment &/or services

**Level 2: INDEPENDENT SYSTEM**
Complete system made of product, equipment, software &/or services within a Business

**Level 3: INTEGRATED SYSTEM**
Combination of 2 or more Level 2 Independent Systems

**Product**
Product PUSH

**Business**
performance

**Process**
performance

**Function**
Specification pull

**Distribution or partners**

**SE direct or partners**

**SE direct**
Capabilities 2: Operational services

- Operational activities that add value to a given product or system
- Operations, maintenance, upgrades, training, service support etc

Examples:
- Alstom Services offers ‘Total TrainLife Management’ services
- Vestas offers energy solutions for different sites – maintenance and operations
Capabilities 2: Operational services

2 types of operational services

- Services ‘embedded’ in the product
  - Digital control: 24/7 monitoring and maintenance to improve energy efficiency
- Services that cannot be embedded
  - maintenance, operations, upgrades, security, etc.

Examples:
- Alstom Services offers ‘Total TrainLife Management’ services
- Vestas offers energy solutions for different sites – maintenance and operations
Alstom Transport: operational services

2 YEARS

SERVICE LIFE 28 YEARS

Design, manufacture & build rolling stock
Cost of building a typical fleet of 70 diesel trains £65m

Operational services:
• maintenance,
• renovation,
• parts & replacement,
• new products

Service life generates income worth £200m
The life cycle cost of a building

- **Development Period**: up to 25% of a building’s life cycle cost is financing & construction.
- **Operating Period**: up to 75% of a building’s life cycle cost is operational.
Feed-back loops from operations into design

- Improve design of current and future systems
- Feedback lessons learnt

1995 PFI project:
- Alstom’s managers responsible for maintenance involved in front-end design.
- Train designers made 250 modifications to create easier-to-maintain trains.
Embedded services

- Services embedded in product or system
- Software monitoring and control to improve performance

- Rolls Royce ‘Power by the Hour’
- TotalCare package
- 70% of RR customers signed up
- long-term service agreement for each engine
Capabilities 3: Business consultancy

Consultancy skills to offer advice:
- Strategic advice: how to plan, design, build, finance, maintain and operate
- Assist with front-end business plans and later stages
- Customer-relationship skills: ability to listen and respond flexibly to customers
- Understand a customer's entire business needs

Developed within existing structures or set up as separate organisations
- Ericsson Global Services
Capabilities 4: Financing capabilities

- Help to pay for ‘new’ capital-intensive projects – General Electric Capital
- WS Atkins ‘Total Solutions for Industry’ joint venture with Royal Bank of Scotland
  - Help customers pay for and reduce the costs of managing an ‘installed base’ of assets
  - Rolling stock, baggage handling systems, 2G mobile, etc.
Develop capabilities into service portfolios

- Standardised, efficient and reusable services
- Reconfigured in different ways to meet each customer’s needs
- Customer selects from a menu of services in combination with products
- Challenge facing firms is to move from one-off, tailored and unique services to standardised and repeatable menus
- Ratio of standardised v customised services
- Ericsson’s target: 70/30
- IBM and BT: 80/20
Ericsson Turnkey Solutions: lifecycle of a project (2000)

**Business Management**

- Identify & Qualify
- Bid & Contract
- Implement & Deliver
- Support & Enhance

**Resource Management**

- Business Consulting e.g.
  - Vision and Strategy
  - Feasibility Study
  - Business Planning
  - Service Development
- Proposal and Contract e.g.
  - Tender evaluation
  - Contract Negotiation
- Network rollout e.g.
  - Project management
  - Logistics
  - Design
  - Engineer
  - Implement
  - Integrate
- Operate and Optimise e.g.
  - Field Maintenance
  - On-Site interventions
  - Optimisation
  - Network Management
Ericsson Global Services – AIM portfolio

**Integrate**
Design, implementation and integration services bringing people, processes and many different technologies together to create efficient and profitable networks for operators

**Advise**
Consultancy services providing operators with business strategy, network strategy, operational planning, network performance assessment and competence development

**Manage**
Technical and commercial services enabling operators to outsource the management, operation and support of their networks, and enhancing the efficiency and profitability of their services
Ericsson Global Services focuses on supporting operators in growing their business by improving net subscriber revenue, by becoming more operationally efficient, and by seamlessly evolving their network to meet current and future demands.

Ericsson Global Services Portfolio

Ericsson's Global Services portfolio includes state-of-the-art expertise in consulting and system integration, network rollout, customer support, learning and managed services.

Trusted Partner

Ericsson Global Services has been entrusted with planning, building, running and enhancing more networks than any other company. A fact that sets us apart from the rest of the services industry is that we are the only company with the ability to build, operate and manage any network, or integrate any network technology, regardless of the equipment currently in place, anywhere in the world.
The total integrated solution offering

**PRODUCTS**
- Single Vendor
- Multiple Vendor

**SERVICES**
- Business Consulting
- Systems Integration
- Operational Services
- Vendor Financing

**INTEGRATED SOLUTION**
- Product module
- Service portfolio
- Turnkey integrated solution

**CUSTOMER TYPES**

**Vertically-integrated** (e.g. Vodafone)
- Sophisticated customers
- Strong in-house capabilities
- Requires specialised or tailored

**Virtual** (e.g. Virgin Mobile)
- Limited in-house capabilities
- Focused on service provision
- Requires full turnkey solution
Integrated solutions require new organisations

- **Back-end**
  - External products
  - Product units
  - Service units
  - External services

- **Front-end**
  - Customer-facing units

**Strategic centre**

**Customisation**
- Project-based units
- Single channel to market
- Driven by the “pull” of client needs and expectations

**Standardisation**
- Reusable capabilities – “push” as an offering
- Modular components & product platforms
- Functional business units and divisions
How to improve innovation and productivity?

- **Customisation**
  - *Innovation* is driven by the **front-end** pull of client
  - Front-end project teams to offer tailored and innovative solutions to clients' needs

- **Standardisation**
  - *Productivity* is driven by the **back-end** push towards standardisation
  - Product and service components provide a menu of offerings
  - Product platform: modular and standardised components
  - Service portfolio: standardised processes and routines
Building capabilities takes time: Ericsson

- Early 1990s – broad-based telecoms equipment (fixed and mobile) manufacturer
- 1st project: One-2-One 1995
- 1996 corporate strategy to move into systems integration and services by 2006
- 1999 Ericsson Services
- 2000 Ericsson Global Services
- 2003 Market and Customer-Facing Units
- 2004-2010 Continuing focus and refinement of integrated solutions offering
Building capabilities takes time and requires cultural change: IBM

- Louis Gerstner becomes CEO 1993-2002
- Crisis in 1992-3: break-up company or vertically integrate into services
- Architect of their transition from a technology/product company to an integrated solutions provider

- “The hardest part of IBM’s transformation was changing the culture – the mindset and instincts of hundreds of thousands of people”
- “I couldn’t flip a switch and alter behaviours”
- “Culture isn’t just one aspect of the game – it is the game”
- “It’s part of the company’s ‘DNA’ which must change when the environment changes.”
What IBM has learnt about integrated solutions

• No longer simply make the product and then sell it!

• Instead you need capabilities, skills and organisational structures to:
  • Sell a capability and knowledge
  • Drive everything you do from the customer back (understand their value chain and business model)
  • Work in cross-functional teams to integrate a customer’s technology, people and core processes
  • To negotiate profitable contracts (walk away from bad contracts!), price your skills and assess risk to meet service level agreements
Conclusions: major challenges facing Vestas

• The shift to a business model of integrated solutions – is a long-term transformation taking decades rather than years!
• Not without conflicts – e.g. new service units offering multi-vendor solutions
• Require new skills and competencies beyond traditional engineering
• New partnerships to access capabilities?
• New organisational structures?
• Changing mindsets and culture….the transformation continues