Kiertotalouden liiketoimintamallit ja Playbook

www.circularplaybook.fi

Jyri Arponen, Senior Lead, Finnish Innovation Fund Sitra
Three drivers underpin the shift towards circular economy:

- **Customer-centricity**: Delivers customer outcomes
- **Sustainability**: Improves resource utilisation
- **Right delivery**: Right purpose
- **Right efficiency**: Right purpose
- **Technology**: Enables new solutions

Source: Accenture
Our overuse of natural resources drives regulators, investors and companies towards sustainability

Development of resource demand

New consumption pattern needed

Gap in supply is driving changing market conditions

- Regulatory pressure is increasing
- Investments are shifting towards responsible businesses
- Businesses raise supplier requirements

Sources: 1: Accenture, Appendix 2 for more details, 2: CNN, 3: CDP

In 2015, the UN general Assembly, representing 193 countries, set the Sustainable development goals. Goal 12 aims, amongst others, at decoupling economic growth from natural resource use

BlackRock CEO Larry Fink asks companies to make positive contribution to society

Companies request suppliers to disclose sustainability performance – 27% of CDP supply chain programme members, representing $2.7 tn in procurement spend, have supplier carbon emission targets
Better customer values can be delivered through offering outcomes instead of selling products

From selling products... ... to offering outcomes

Profit is generated by selling as many products as possible, fuelling inefficiencies along the value chain

Example: From selling engines...

Profit is generated by delivering solutions that fit specific customer needs, minimising inefficiencies and increasing consumer experience

... to selling “Power by the hour” to customers for a fixed charge per hour of operation, per ship. Rolls Royce offers planned maintenance and monitoring services for the equipment aboard from on-shore with the help of sensors.

Source: 1: Company website
Finnish technology adaptors are already successfully using the three drivers to generate value and oppose disruptors

Tamturbo provides ‘Compressed air-as-a-Service’ to industrial companies

- Compressor has high-efficiency electric motor
- Customers avoid high initial investment and hassles with maintenance
- Compressors are reinstalled at new clients at the end of contract

eRent offers a platform to track, manage, rent and rent out equipment

- Service combines digital tracking methods, internet of things and cloud services
- Customers get easily accessible, mobile application
- Platform maximises usage rate of equipment

Wärtsilä subsidiary Eniram offers full visibility of onboard operations of a vessel with an analytics solution

- Advanced algorithms decompose and model data
- Mobile app was jointly developed with customers
- Fuel savings are derived from optimisation and breakdown is reduced
FROM LINEAR TO CIRCULAR

Focusing on the change to customer-centricity and digitally enabled business models

Source: Accenture
With the Circular Economy Playbook and tools you achieve circular advantage and measurable business cases [www.circularplaybook.fi](http://www.circularplaybook.fi)

The playbook consists of 6 chapters with circular economy concepts, best practices and tools to guide your business to identify and define your circular economy opportunity and develop a plan to realize circular advantage.

**PLAYBOOK CHAPTERS**

1. Why circular economy?
2. What opportunities exist?
3. Which capabilities are required?
4. Which technologies can support?
5. How to design the transformation journey?
6. Industry deep dives

**EXAMPLE TOOLS**

- Value case tool
- Business model development toolkit
- Capability maturity assessment
- Technology maturity assessment
- Roadmap development
- Business model canvas

Additional tools available in the playbook

@SitraFund @jyri_Arponen www.circularplaybook.fi
We engaged a large group of players in the Finnish manufacturing ecosystem, time for global scale up.
Circular economy is about turning inefficiencies in linear value chains into business value

Inefficiencies of linear value chains

1. UNSUSTAINABLE MATERIALS
   - Material and energy that cannot be continually regenerated
   - For example, direct and indirect materials are not renewable or bio-based

2. UNDERUTILISED CAPACITIES
   - Underutilised or unused products and assets
   - For example, products are not operating full hours or full functionality is not useful

3. PREMATURE PRODUCT LIVES
   - Products are not used to fullest possible working life
   - For example due to new models and features or lack of repair and maintenance

4. WASTED END-OF-LIFE VALUE
   - Valuable components, materials and energy are not recovered at disposal
   - For example, not recycled or recovered at end of life

5. UNEXPLOITED CUSTOMER ENGAGEMENTS
   - Sales organisation focus on selling functionality of product rather than the customer problem
   - For example, missing opportunities to engage customers throughout the product life-cycle to offer additional services and add-on sales

Source: Accenture, Appendix 2 for more details
Five circular business models reduce inefficiencies in the linear model and create value for companies

**Reform use of resources**

**CIRCULAR SUPPLY CHAIN**
- Use of renewable energy, bio-based or potentially completely recyclable materials

**Recover value in waste**

**RECOVERY & RECYCLING**
- Recovery of usable resources or energy from waste or by-products

**Optimise capacity use**

**SHARING PLATFORM**
- Increased usage rates through collaborative models for usage, access, or ownership
- Offer outcome oriented solutions

**Extend life cycles**

**PRODUCT AS A SERVICE**
- Offering of products for use with retention of product ownership which incentivises increase in resource productivity along the whole life cycle
- Extend life cycles

**PRODUCT LIFE EXTENSION**
- Extension of the life cycle through repair, maintenance, upgrading, resale and remanufacturing

Source: Accenture

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Business model specific sub-models modify different steps of the value chain to make it circular.

As a Service models are mostly concerned with the operation phase, but span across the value chain.

Circular sub-models:
- Build to last
- Circular supplies

Product design
Sourcing
Manufacturing
Logistics
Marketing & sales
Product use
End of life disposal

- Performance as a Service
- Product as a Service
- Share
- Repair & Maintain
- Upgrade
- Resell
- Remanufacture
- Recycle/upcycle
- Resell
- Remanufacture
- Recycle/upcycle

LEGEND
- Linear value chain
- Circular Economy Value Chain
  - Circular Supply Chain
  - Product Life Extension
  - Sharing platform
  - Product as a service
  - Recovery & Recycling

Source: Accenture

@SitraFund  @jyri_Arponen circularplaybook.fi
## Significant Value Can Be Created

<table>
<thead>
<tr>
<th>Circular Supply Chain</th>
<th>Revenue impact</th>
<th>Margin impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce cost of direct material (price reduction)</td>
<td>N/A</td>
<td>++</td>
</tr>
<tr>
<td>Reduce complexity through modular design</td>
<td></td>
<td></td>
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<tr>
<td>Reduced energy usage</td>
<td></td>
<td></td>
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<tr>
<td>Sharing Platform</td>
<td>+</td>
<td>++</td>
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<tr>
<td>Increase sales margins</td>
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<tr>
<td>Charge transaction fees</td>
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<tr>
<td>Sell add-on services</td>
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<tr>
<td>Product Life Extension</td>
<td>+++</td>
<td>++</td>
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<tr>
<td>Increase service sales (maintenance &amp; repair)</td>
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<td></td>
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<tr>
<td>Increase sales of spare parts</td>
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<tr>
<td>Sell second hand products/materials</td>
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<tr>
<td>Recovery &amp; Recycling</td>
<td>N/A</td>
<td>+</td>
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<tr>
<td>Reduce material costs (volumes)</td>
<td></td>
<td></td>
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<tr>
<td>Reduce disposal costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New revenue: growth in share of wallet, entry into new segments</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Increased sales margins</td>
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### TOTAL

- **Step change in growth...**
- **...at attractive margins**

Source: Accenture
Companies have developed circular pilot ideas specific for their company

Circular ideas identified during workshops

<table>
<thead>
<tr>
<th>Circular Supply Chain</th>
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<tr>
<td>Sharing Platform</td>
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<td>Product as a Service</td>
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<td>Recovery &amp; Recycling</td>
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Example ideas

- Build machines using modular design incl. product passports/tracking, to enable product-life-cycle services and product take-backs
- Seasonal rentals of multi-purpose machines in municipal areas as utilization rate varies significantly over the year. Use partnership network to facilitate sharing
- Kitchen-as-a-Service: offer rental services and maintenance of outdoor kitchen for catering and events
- Manage repair and maintenance service of waste shredders by outsourcing service staff to achieve cost advantage through building experience and predictive maintenance
- N/A
EARLY MOVERS WITHIN MANUFACTURING INDUSTRY HAVE ALREADY STARTED

<table>
<thead>
<tr>
<th>CIRCULAR SUPPLY CHAIN</th>
<th>SHARING PLATFORM</th>
<th>PRODUCT LIFE EXTENSION</th>
<th>RECOVERY &amp; RECYCLING</th>
<th>PRODUCT AS A SERVICE</th>
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Automotive's latest model: Redefining competitiveness through the circular economy.
3 KEY AREAS OF DEVELOPMENT TO MOVE FROM LINEAR TO CIRCULAR ECONOMY

A. Customer value delivery

B. Resource handling

C. Organisation and collaboration
New technologies are needed to enable the circular business models

Most interesting technologies enabling circular business models
SME input from workshops

<table>
<thead>
<tr>
<th>Technology</th>
<th>Circular opportunities</th>
<th>Identified challenges</th>
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<tbody>
<tr>
<td>Internet of Things &amp; Industrial Internet</td>
<td>Enables exchange of data generated in sensors and triggering of action, and therefore supports e.g. condition-based monitoring</td>
<td>How to collect, analyse and leverage data?</td>
</tr>
<tr>
<td>Big data</td>
<td>Enables descriptive and predictive analytics, and can be used e.g. for delivering predictive maintenance services</td>
<td>How to ensure data security and quality?</td>
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<tr>
<td>Radio-frequency identification (RFID)</td>
<td>Enables product identification throughout the lifecycle and thus facilitates e.g. product take-back</td>
<td>How to avoid risks related to technology?</td>
</tr>
<tr>
<td>Energy harvesting</td>
<td>Enables capturing energy that would otherwise be lost, such as heat, light, sound, vibration or movement</td>
<td></td>
</tr>
</tbody>
</table>

Technologies enabling more efficient data collection and usage are seen as most interesting, yet challenging
IMPLEMENTATION
PREPARE FOR BARRIERS

Type of Barrier | Challenges
---|---
Organisational & Cultural | • Difficulty of customer-centric innovation and cross-functional collaboration
• Difficulty of changing old mindsets of employees
• Pressure of day-to-day priorities
• Lack of skills in new technologies
• Lack of skills in solution selling

Financial | • Circular business models have different funding requirements (e.g. Product as a service requires higher working capital)
• Difficulty of finding financing partners
• Insufficient understanding of risks and mitigation strategies

Ecosystem | • Complex supply chains make it difficult to control products after sale, tracking materials and components
• Difficulty of finding suitable partners need to be identified to fill gaps

Source: Accenture
Behaviour, values and mindset changes are required to deliver outcome-oriented solutions

**Behaviours**

The outward signs of culture

They are informed by underlying values and mindsets

**Values**

The things we believe are most important

We have some awareness of our own values, but they are largely invisible to others

**Mindsets**

The assumptions we hold about the way the world is

These are often invisible to us and to others – the things we take for granted

**Culture**

“The way we do things around here”

Culture is the sum of how people in the organisation assume, believe, and act. This differentiates from competitors
Ecosystem partners can help in bridging internal capability gaps and overcome barriers

Development of Ecosystem over time

External ecosystem partners

**Customers**
- Current or potential new customers
- Reveal insights on needs and iteratively improve solution

**CE Thought-leaders**
- Universities, networks and peers with extensive CE knowhow
- Serve as source of inspiration, sounding board and (peer-) learning forum

**Suppliers & delivery partners**
- Goods and services providers for internal use and collaborative solution delivery (waste/material management, logistics, insurance, payment solutions, ...)
- Grant access to circular material, are partners for joint generation of circular material or partners for service delivery

**Financiers**
- Public institutions, banks, investment funds, supply chain partners
- Give access to funding required for offering the CE business model

**Technology providers**
- Providers of technologies and software enabling digital solutions or internal processes
- Engage in solution and production process design and supply required technology

**Public and societal actors**
- Governments, associations and other representatives
- Influence public perception and opinion and influence or set framework conditions

**Did you know?**
On the Circular Economy site, there is a tool called Ecosystem partner identification, which helps you in identifying ecosystem partners to support with your circular business idea.
Going forward, the ambition is to engage 500 more companies to start their circular transformation.

**FOLLOW-UP 50 PILOT and ANCHOR COMPANIES**

- Workshops
- One on One Follow ups
- **Business Finland** services, incl. Sampo programme
- Ecosystem meetings

**ENGAGE 500 NEW COMPANIES**

- **TECHNOLOGY INDUSTRIES FINLAND**
  - Partnership & Growth road show
- **FINNISH QUALITY ASSOCIATION**
  - Training programs, consultancy and info sessions
- **GROWTH COLLECTIVE FINLAND**
  - Partnership & FutuRE Back Summit
- **BUSINESS FINLAND**
  - Circular Finland Program
- **GLOBAL PROJECTS AND PARTNERSHIPS**
  - **NORDIC INNOVATION**
  - IVA (Sweden), RINA (Italy), WCEF
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RISE TO SHINE!