At your service!
circular business model prototypes for a
service provider in the construction industry

Robert van den Brink (4092422)
Overview

- Introduction
- Lessons from other industries
- Designing the service provider’s business model
- The service provider in practice
- Conclusions
Introduction
the circular economy (in depth) | the construction industry | research methods
Introduction

- Economy is changing from resource abundance to resource scarcity (EMF, 2014)

- Construction industry is responsible for large proportion of waste (Antink et al., 2014)

- Circular economy tries to design out the waste

- Circular economy does this through an incentive shift
Introduction

Source: EMF (2012)
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Introduction

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The circular economy in depth

- Current definition of CE lacks clarity  
  (Mentink, 2014)

- ‘An industrial economy that is restorative by intention’  
  (EMF, 2013)

- ‘An economic system with closed material loops’  
  (Mentink, 2014)

- But not only a problem with the definition..
The circular economy in depth

- Definition CE for this research:

‘A circular economy is an economic system with cyclical material loops based on a financial incentive’

- With some preconditions that followed from the problem analysis..
CE and the construction industry

- Project-based, with unique products
  (Vrijhoef, 2011)

- Artisinal construction without generalization
  (Eastman et al., 2008)

- Long product-lifetime

- Capital intensive
  (Vrijhoef & Koskela, 2000)

- Collection of different stakeholders
  (Segerstedt & Olofsson, 2008)
CE and the construction industry

(Own image, based upon Segerstedt & Olofsson, 2010)
CE and the construction industry

- Exercises: Circular construction economy
- Ownership becomes blurry
- Financing becomes difficult, current model makes sense
- The more components, the harder it will become to implement the circular economy
CE and the construction industry

- Comparison with known general obstacles
  (Kok et al., 2013)

- Main problem surrounding organizational issues: responsibilities, liabilities, and ownership

- Also both technological and financial obstacles when it comes to the construction industry
CE and the construction industry
CE and the construction industry

(Own image)
CE and the construction industry

(Own image)
CE and the construction industry

(Own image)
Problem statement

‘an organization of the service provider that adheres to the definition and principles of the circular economy, and how current supply side stakeholders relate to this actor’
‘How to organize the service provider in such a way that its role adheres to the definition and principles of the circular economy?’

and secondary:

‘How does this organization relate to the current supply side stakeholders in the construction process?’
Research question

- Research question essentially deals with: the organizational problem and the two transactions surrounding the service provider.

- These two transactions in particular as circular economy is first and foremost about the supply side of the construction organization.

- The answer (final result) translates into business model prototypes.
Research design

Problem analysis & statement
Research design

- Problem analysis & statement
- Literature & case studies
- Service provider & Sustainable implementation

(Own image)
Research design

Problem analysis & statement

Literature & case studies

Business model prototypes

Service provider & Sustainable implementation

Theoretically constructed models

(Own image)
Research design

- Problem analysis & statement
- Literature & case studies
- Business model prototypes
- Service provider in practice

- Service provider & Sustainable implementation
- Theoretically constructed models
- Interviews, case-studies, cross-references
Research design

- Problem analysis & statement
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- Conclusions

Service provider & Sustainable implementation
Theoretically constructed models
Interviews, case-studies, cross-references

(Own image)
Research design

- Research design inspired by Eisenhardt (1989)

- Pragmatic approach

- Research is unique in that it: (1) researches the circular service provider in the construction industry from a supply-side perspective, and (2) does this from a carefully built-up theoretical construct that critically reflects upon both existing circular economy theory and the current construction industry before coupling the construct back to practice.
Lessons from other industries
the service provider | implementation of sustainable concepts
Other industries – the service provider

- In other industries service providers are present
  (Not new (Schmenner, 2009)

- Difference between pure service providers and manufacturing service providers
  (Baines & Lightfoot, 2013; Biege et al., 2012; Tukker, 2004)

- Different reasons for appearance: Economic, Environmental, Market & Social, Technology innovation, Knowledge
  (Baines & Lightfoot, 2013; Bastl et al., 2012; Biege et al., 2012; Fang et al., 2008; Gebauer & Friedli, 2005; Jonker, 2015; Windahl & Lakemond, 2006)
Other industries – the service provider

- Financial gain is possible, however services need to account for substantial amount of company sales, i.e. 20-30% (Fang et al., 2008)

- Only marginal environmental improvement to be expected with product oriented services, result- and ability driven services show greater potential (Tukker, 2004)
Other industries – the service provider

(Baines & Lightfoot, 2013)
Other industries – the service provider

(Baines & Lightfoot, 2013)
Other industries – the circular economy
Other industries – the circular economy

(Own image)
Other industries – concluding

(Own image)
Other industries – concluding
Other industries – concluding
Other industries – concluding
Other industries – concluding

- Note of caution:

‘A circular economy is an economic system with cyclical material loops based on a financial incentive’

- Financial incentive is ONLY CERTAIN with rising resource prices

- Financial incentive CAN appear as a consequence of efficient business operations

‘Circular economy is a business strategy that, if governed correctly, is sustainable’
The service provider’s business model
solutions | activities | framework | prototypes | prototypes & theory
The service provider’s business model

- More / higher
- Agreements of intention etc.
- Ownership / circular responsibility client
- Vertical integration
- Ownership / circular responsibility supplier

(Own image)
The service provider’s business model

- Agreements of intention etc.
- Ownership / circular responsibility client
- More / higher

Solutions: (e.g.)
- Buy-back, buy-back

Vertical integration
Ownership / circular responsibility supplier

(Own image)
The service provider’s business model

- More/higher agreements of intention etc.
- Ownership/circular responsibility client

- Vertical integration
- Ownership/circular responsibility supplier

- Solutions: (e.g.) buy-back, buy-buyback
- Solutions: (e.g.) financial lease, operational lease
The service provider’s business model
The service provider’s business model

(Bijsterveld, 2014)
The service provider’s business model
The service provider’s business model

- Several requirements:

- Behavior of both client and supplier need to change

- Performance should not be too specified by the client

- Need for a tighter organization on the supplier’s part

- Decoupling points need to be incorporated in the used products

- Willingness, trust, and transparency are needed
The service provider’s business model

- Several business operations:
- The service provider is responsible for the longer term
- The service provider is responsible for lease with the client
- The service provider needs to deal with the specific characteristics of the construction industry
- The service provider is responsible for picking products / services
- The service provider needs to determine the building lifetime
- The service provider needs to check the decoupling points
The service provider’s business model

(Source: Bocken & Short, 2015)
The service provider’s business model

Value Proposition

1. Product / service
   Housing that is completely tailored to the needs of the customer, at a certain performance, for a given time-period

2. Customer segments and relationships
   Broad segment with specific clients looking for a specific performance

3. Value for customer, society, and environment
   The customer receives tailored housing, society and the environment receive this in a sustainable manner
The service provider’s business model

Value creation & delivery

4. Activities
The service provider performs one, some, or all of the following: designing, building, financing, maintaining, operating.

5. Resources
The inherent knowledge the service provider has about the activities it performs.

6. Distribution channels
Can differ between service providers.

7. Partners and suppliers

8. Technology and product features
Non-toxic, pure materials of which the origins are known, supported by renewable energy. Also flexible, but the amount thereof is dependent upon the chosen model under point 7.
The service provider’s business model

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<th>Value Capture</th>
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<th>Variant 2</th>
<th>Variant 3</th>
<th>Variant 4</th>
<th>Variant 5</th>
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<td><img src="variant4.png" alt="Diagram" /></td>
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<th>Variant 5</th>
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<td>Income stream, claim on materials</td>
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</table>

10. Value capture for key actors (incl. environment and society)

11. Growth strategy / ethos

Can differ between service providers
The service provider’s business model

Are all competences (designing, building, maintaining, operating) present within the organization of the service provider?

Yes

Variant 1

Lease with suppliers

No

No lease with suppliers

Yes, but preference for other variant than 1

Variant 2

Variant 3

Variant 4

Variant 5
The service provider’s business model

(Own image)
The service provider’s business model
The service provider’s business model
## The service provider’s business model

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<tr>
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<th>Variant 3</th>
<th>Variant 4</th>
<th>Variant 5</th>
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<td>Medium</td>
<td>Fairly High</td>
<td>High</td>
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<tr>
<td>Fairly low</td>
<td>Medium</td>
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<tr>
<td>Fairly high</td>
<td>Medium</td>
<td>Medium</td>
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<td>Low</td>
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(Own image)
The service provider in practice
findings & discussion | roadmap | possible consequences
The service provider in practice

- Validation interviews
- Subsequent case-studies
- Cross-referencing findings with Stigter (2016)
The service provider in practice

- Validation interviews
- 4 in total, 2 companies that are related to ce, 2 that are not.
- Companies that perform different roles; developer, contractor, specialist
- Semi-structured interviews of 1 hour to 1h15m
- Coded and processed according to Dierkx & De Casterlé (2014)
The service provider in practice

- Subsequent case-studies
- 4 sustainable projects in which the interviewees recently took part
- 1 project was undertaken from a circular point of view
- The other 3 from different sustainable perspectives
The service provider in practice
The service provider in practice

- Cross-referencing findings with Stigter (2016)
- Similar starting point
- Different focus through further research
Conclusions
The service provider in practice

- Acknowledgement of the earlier made analysis
- Business model prototypes not readily applicable in the construction industry
- Base- to intermediate circular services more likely in the near future
- Prototypes 3 and 5 have interviewees’ preference
- Most similar to the current situation in the industry
The service provider in practice

- The question who takes on the role of the service provider remains largely unanswered, however;

- If the service provider would come from the construction industry, then either a consortium of different parties or a smaller organization (according to prototype 3 and 5)

- If the service provider would be a new entity, preference for a prototype is unclear. Could however avoid being bound to prototype 3 and 5
The service provider in practice

- Recycle
- Remanufacture
- Refurbish
- Redeploy

Amount of effort

more / higher
The service provider in practice

- Recycle
- Remanufacture
- Refurbish
- Redeploy

Amount of effort

more / higher

(Own image)
The service provider in practice

[Diagram with axes labeled Td, Tt, Tr, and t -> showing the options Recycle, Remanufacture, Refurbish, and Redeploy along with the vertical axis labeled Amount of effort and the horizontal axis with more / higher.

(Own image)
The service provider in practice

- Recycle
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- Redeploy

Amount of effort

core / higher
The service provider in practice

- Recycle
- Remanufacture
- Refurbish
- Redeploy

Amount of effort: more / higher

(Own image)
The service provider in practice

Recycle
Remanufacture
Refurbish
Redeploy

more / higher
Amount of effort

Td  Tt  Tr  t ->
The service provider in practice

- Recycle
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Amount of effort: more / higher
The service provider in practice

Recycle

Remanufacture

Refurbish

Redeploy

more / higher

Amount of effort

(Td) (Tt) (Tr) t ->

(Own image)
The service provider in practice

- Recycle
- Remanufacture
- Refurbish
- Redeploy

(Amount of effort)

(Own image)
The service provider in practice

Recycle
Remanufacture
Refurbish
Redeploy

more / higher

Amount of effort

(Own image)
The service provider in practice

- Recycle
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- Refurbish
- Redeploy

Obstacles & Uncertainties

more / higher

Amount of effort

(Own image)
The service provider in practice

- Judicial uncertainties
The service provider in practice

- Judicial uncertainties
- Ownership of separate building components
- Progressive quality standards
The service provider in practice

- Judicial uncertainties
- Ownership of separate building components
- Progressive quality standards
- May be reduced by:
  - 1. Few active stakeholders in a project
  - 2. Focus on a new-built project
  - 3. Flexibility in design
The service provider in practice

- Financial uncertainties
The service provider in practice

- Financial uncertainties
- Future financial uncertainties
The service provider in practice

- Financial uncertainties
- Future financial uncertainties
- 1. Research by Stigter (2016) finds that profitability depends upon resource prices
- 2. Uncertainty about redeployment capabilities
- 3. Unfavourable governmental policies
The service provider in practice

- Unclear market demand
The service provider in practice

- Unclear market demand
- Advanced services not yet present in the industry
The service provider in practice

- Unclear market demand
- Advanced services not yet present in the industry
- May occur with:
  - 1. Parties with a temporary or uncertain demand
  - 2. Parties operating in volatile markets
  - 3. Parties that are not able to pay the initial investment
The service provider in practice

Obstacles & Uncertainties

Judicial uncertainties
Financial uncertainties
Unclear market demand
The service provider in practice

- Obstacles & Uncertainties
  - Judicial uncertainties
  - Financial uncertainties
  - Unclear market demand

- Innovation
The service provider in practice

- A roadmap for an advanced services provider
- 1. The circumstances meet the requirements
- 2. The service provider is willing to deliver and expects resource prices to rise in the future
- 3. The building life-time is determined (in conjunction with the client)
- 4. The service provider picks or develops those services that are needed to deliver the agreed upon performance
The service provider in practice

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The service provider in practice

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- 4. The service provider picks or develops those services that are needed to deliver the agreed upon performance
- 5. The service provider needs to deal with the specifics of the industry (variants) and checks the decoupling points
- 6. The service provider takes on the operational responsibilities towards the client
- 7. Products are redeployed at an end-of-contract or end-of-loop situation
The service provider in practice
The service provider in practice

| Variant 1 | Unchanged |
| Variant 3 / 5 No consortium | Unchanged |
| Variant 3 / 5 Consortium | Unchanged |
The service provider in practice

<table>
<thead>
<tr>
<th>Variant</th>
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### The service provider in practice

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(Own image)
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<td>Supplier</td>
<td>Supplier (product designer/composer)</td>
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<td>Part of service providing consortium</td>
<td>Supplier / Part of service providing consortium</td>
<td>Supplier</td>
<td>Supplier (product designer/composer)</td>
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# The service provider in practice

<table>
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<tr>
<th></th>
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<th>Owner</th>
<th>Financier</th>
<th>Main contractor</th>
<th>Project Developer</th>
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(Own image)
The service provider in practice

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Conclusions
Conclusions

• Business model prototypes not directly applicable because of certain obstacles, that can for a great deal be identified or mitigated

• Unclear who will be the service provider;
  • (1) intra-industrial and with consortium, current coordinating parties
  • (2) intra-industrial and without consortium, dominant supplier
  • (3) Inter-industrial, then unknown

• In all cases (1-3), there could be a considerable effect upon current stakeholders

• Only an incremental gain in sustainability expected on a short-term basis as a consequence of the preference for base- to intermediate services
Conclusions

- Further research should focus on:

1. Enhancing the validity of this research by gathering a bigger sample
2. The development of complete base- to intermediate circular business model prototypes to capture most of the possible incremental environmental gain.
3. The judicial uncertainties need to be researched in depth as well as possible solutions for these uncertainties
4. Finding a pilot-project to enhance practicality
Conclusions

- Market parties are encouraged to:

1. Pursue the business model prototypes
2. Start with a project that is; product-based, new-built, without a consortium, and is both rigid and flexible
3. Critically reflect upon the incumbent competences and uniqueness of the delivered products
4. Also pursue base- to intermediate circular services models
Conclusions

- Although not readily applicable, still insight into the workings of the circular economy plus probable future use

- Base- to intermediate solutions might accomplish lower environmental gains, but it also avoids supplying parties from shaping the market
'A circular project might just be a phone call away!'


References


Appendix: Legal compliance variants (1)

- All of the developed variants are legally compliant

- Lease not codified in Dutch Law

- This means that regarding the legal compliance of leasing a look has to be given at the economic reality (a so-called substance-over-form-case)

- In effect this means looking at ‘goederenrecht’ instead of ‘privaatrecht’

- This in turn means that judicial ownership is always held with the lessor, regardless of the degree of economic ownership of the lessee
Appendix: Legal compliance variants (2)

- The ‘broad’ definition of ownership in Dutch case law causes this situation

- In the case of a sub-lease, the original lessee becomes a lessor to the sub-lessee while at the same time the original lessee remains a lessee to the original lessor

- This in order for the original lessor to remain judicial ownership over its asset

- This constitutes a judicial improbability, but it is the economic reality, or substance-over-form case.
Appendix: Variant 1

[Diagram showing relationships between User, Financier, and Service provider]
Appendix: Variant 2
Appendix: Variant 3
Appendix: Variant 4
Appendix: Variant 5