

OVERCOMING BARRIERS WHEN IMPLEMENTING A PRODUCT-AS-A- SERVICE BUSINESS MODEL

P5 presentation of Luuk Kuipers
22 January 2021

INTRODUCTION

Content

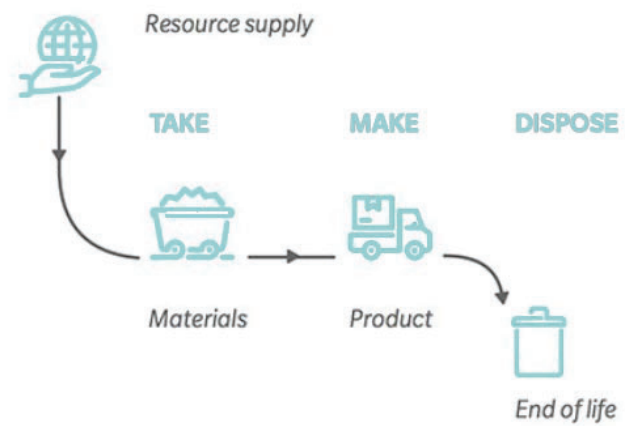


INTRODUCTION

INTRODUCTION

BACKGROUND INFORMATION

LINEAR ECONOMY



INTRODUCTION

BACKGROUND INFORMATION

LINEAR ECONOMY



INTRODUCTION

BACKGROUND INFORMATION

LINEAR ECONOMY



INTRODUCTION

BACKGROUND INFORMATION

But....

This linear thinking is not sustainable or future proof

INTRODUCTION

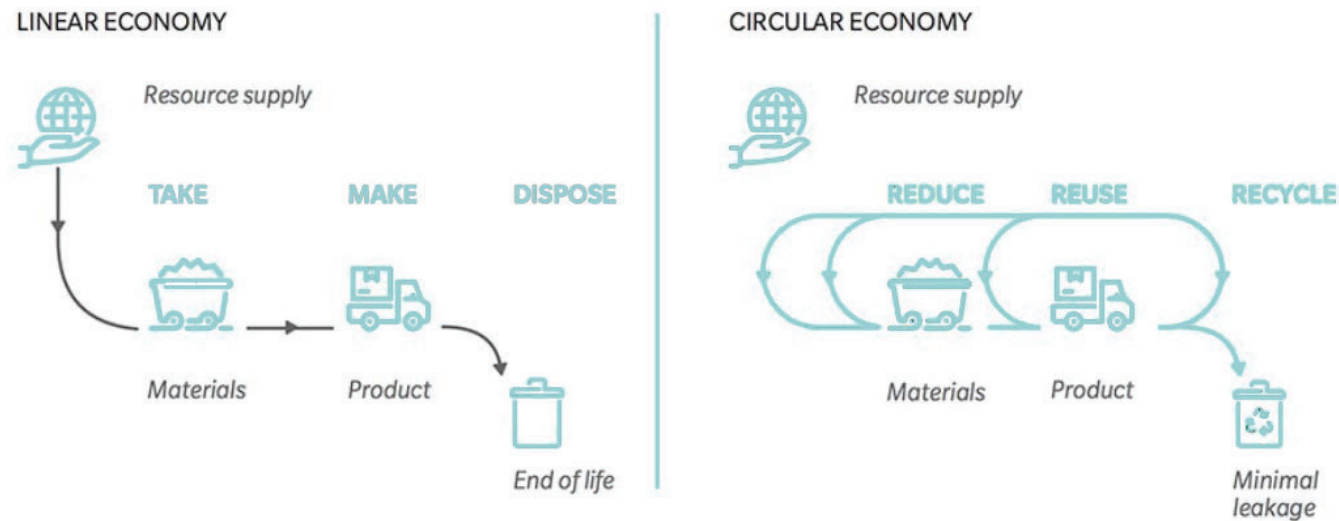
BACKGROUND INFORMATION

Therefore....

Multiple countries have agreed on becoming 100% circular by 2050, during the paris agreements in 2015.

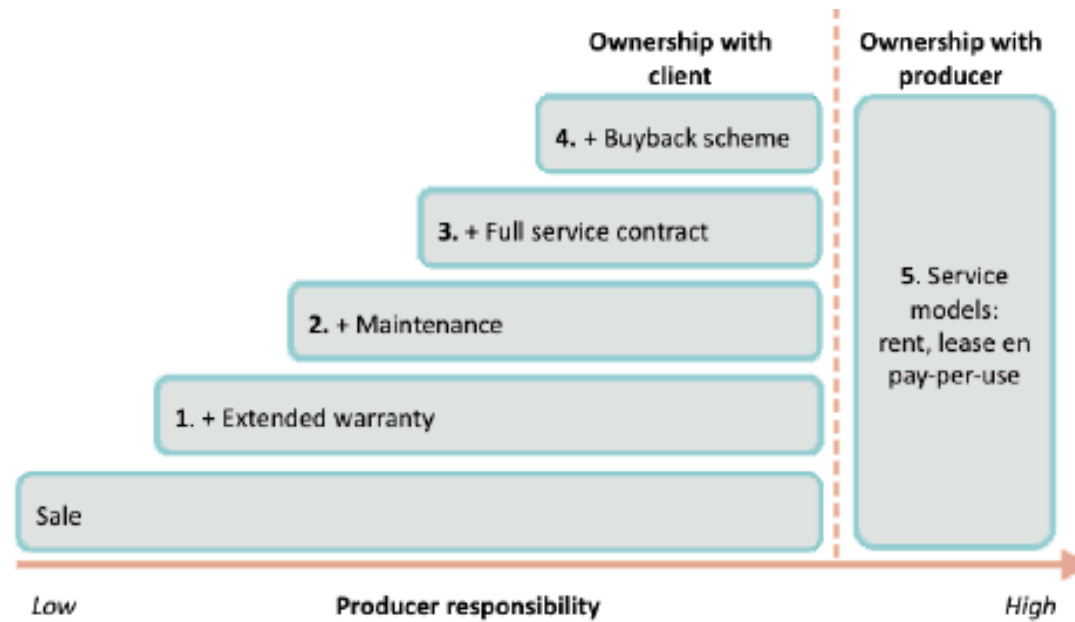
INTRODUCTION

BACKGROUND INFORMATION



INTRODUCTION

Extended Producer Responsibility



(Smeets, 2020)

INTRODUCTION

Extended Producer Responsibility



**Shift waste management
from municipalities to
producers**



**Promote design for the
environment/eco-design**



Close material loops

INTRODUCTION

Product-as-a-Service

homie

Swapfiets

signify



Bundles



INTRODUCTION

Product-as-a-Service

“A PaaS is an integrated offering of products and services with a revenue mechanism that is based on selling availability, usage or performance.”

INTRODUCTION

Product-as-a-Service



INTRODUCTION

PROBLEM STATEMENT

However....

An **holistic overview** of a theoretical and practical perspective on barriers and enablers regarding the transition from a traditional to a service model is **missing**

INTRODUCTION

RESEARCH AIM

Therefore....

This research aims at gathering findings from both **theory and practice** on the **barriers and enablers** seen in the implementation of the PaaS BM in the Dutch built environment.

INTRODUCTION

RESEARCH QUESTIONS

“HOW TO OVERCOME THE BARRIERS WITH RESPECT TO THE FINANCIAL, LEGAL AND ORGANISATIONAL ASPECTS OF IMPLEMENTING A PRODUCT-AS-A-SERVICE BUSINESS MODEL WITHIN THE DUTCH BUILT ENVIRONMENT?”

RESEARCH SUB-QUESTIONS

- 1** What is a Product-as-a-service business model?
- 2** Which barriers are identified in the implementation of a PaaS business model in the Dutch built environment from a theoretical and practical perspective?
- 3** Which enablers are identified to overcome the barriers when implementing a PaaS business model in the Dutch built environment from a theoretical and practical perspective?
- 4** Which barriers and enablers are the most important for the implementation of the PaaS business model in the Dutch built environment.

METHODOLOGY

METHODOLOGY

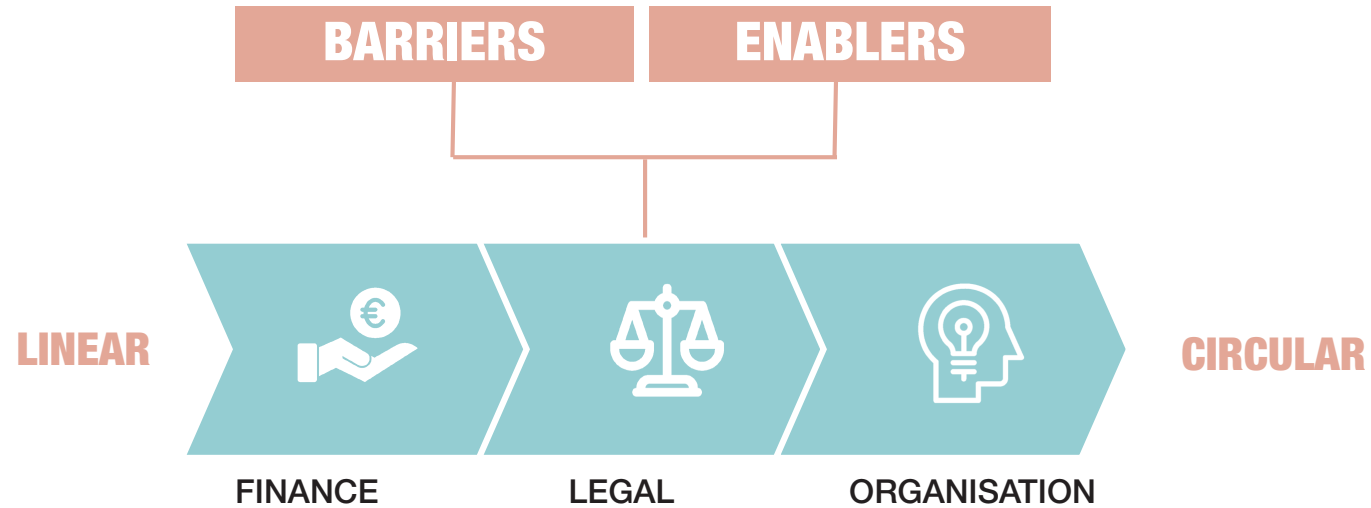
RESEARCH STRUCTURE





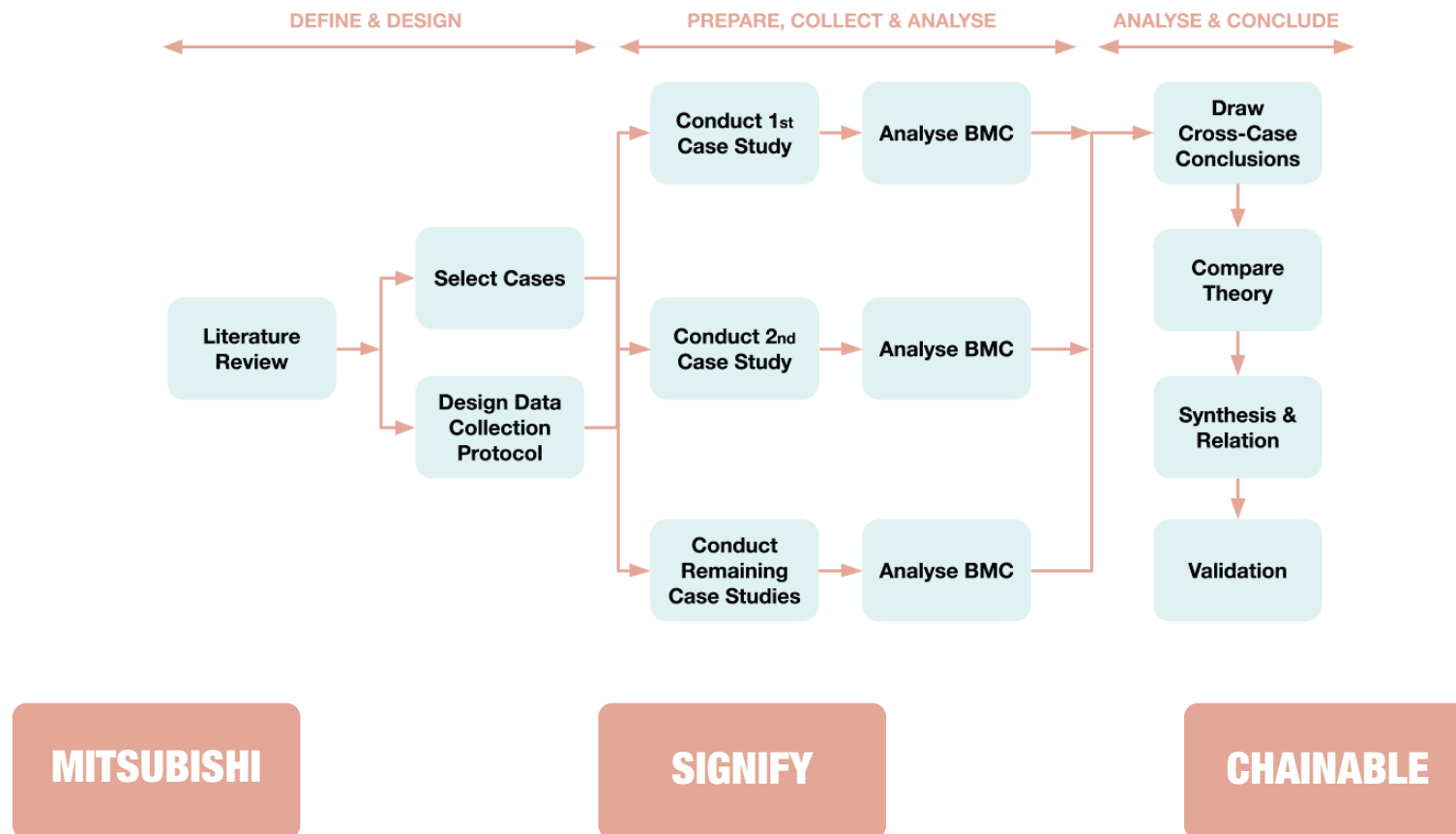
METHODOLOGY

STEP 1 IDENTIFY



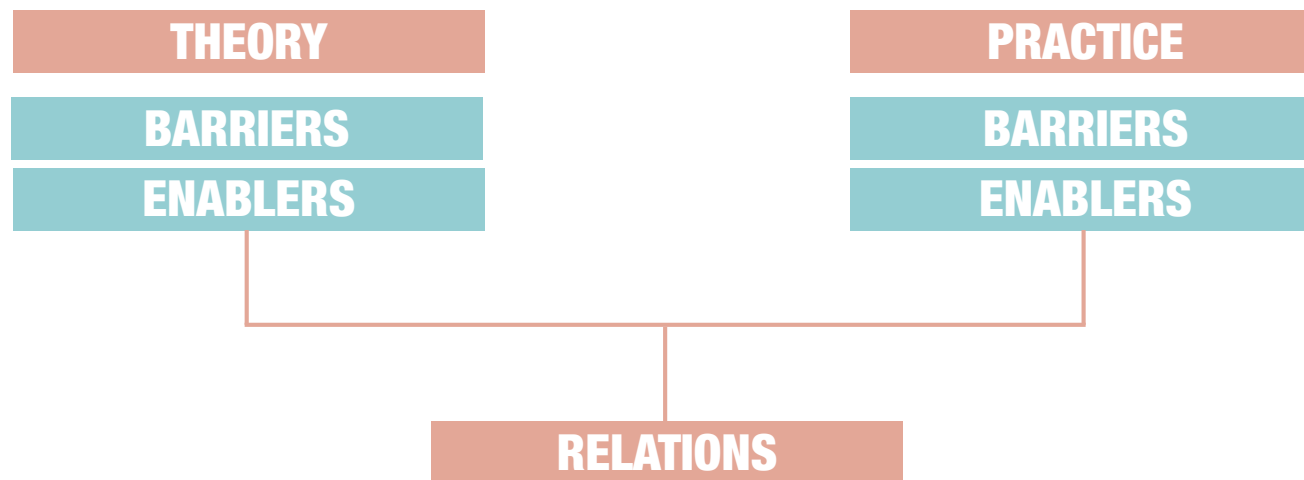
METHODOLOGY

STEP 2 EXPLORE



METHODOLOGY

STEP 3 SYNTHESIS



METHODOLOGY

STEP 4 VALIDATE



LITERATURE REVIEW



LITERATURE REVIEW

BARRIERS

LITERATURE

BARRIERS REVIEW #1

BARRIERS REVIEW # 2

BARRIERS REVIEW # 3

BARRIER OVERVIEW

Table 1 Identified barriers for PSS implementation

Aspect	Notation	Barriers	Reference
External	O_1	Lack of support from relevant laws and regulations	[4, 6, 16, 28, 31, 36, 38]
	O_2	Lack of market acceptance	[6, 31]
Internal	O_3	Lack of strategic planning	[6, 36]
	O_4	Rejection of change by internal personnel	[29]
	O_5	Lack of an ideal management information system	[10, 32]
	O_6	Lack of training and education	[29]
	O_7	Lack of technical personnel and support	[29, 41, 47]
	O_8	Lack of support from senior management	[17, 34]
	O_9	Lack of awareness related to PSS	[22]
Maintenance	O_{10}	Load increase in maintenance service system	[4, 6, 29]
	O_{11}	Difficulty in managing components for maintenance service	[23, 35, 43]
Remanufacturing	O_{12}	Different recycling time and quantity as well as product quality	[8, 19]
	O_{13}	Difficulty controlling and managing materials	[9, 23, 34]
	O_{14}	Lack of reverse logistics	[12]

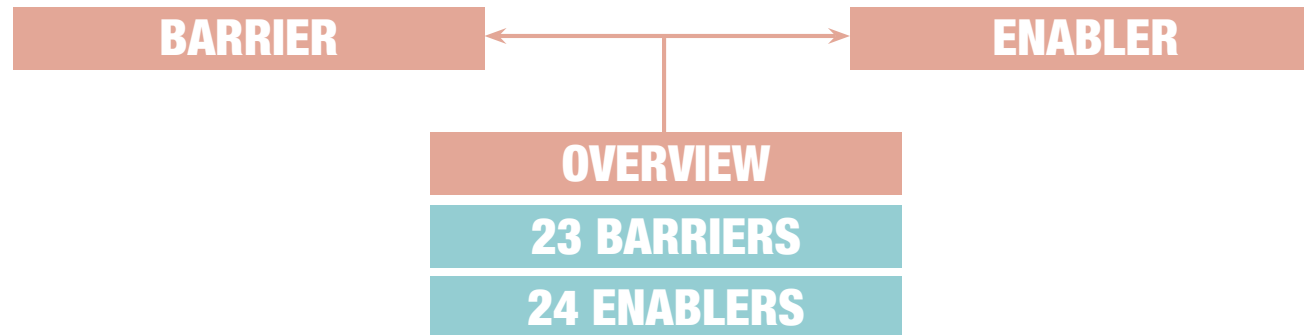
Coding framework of CE barriers

Barrier	Example source
Cultural Lacking awareness and/or willingness to engage with CE	Hesitant company culture "No sense of urgency, company culture" Pfeffer (2017, p.12)
	Limited willingness to collaborate in the value chain "Difficult to collaborate with other companies" Mont et al. (2017, p.29)
	Lacking consumer awareness and interest "Lack of consumer awareness" Mont et al. (2017, p.30)
Regulatory Lacking policies in support of a CE transition	Operating in a linear system "Current linear system in place" Pfeffer (2017, p.15)
	Limited circular procurement "We need people who do not only look at costs when doing procurement, but also at other things" Manager (incumbent)
	Obstructing laws and regulations "Current governmental legislations and ruling" Pfeffer (2017, p.15)
Market Lacking economic stability of circular business models	Lacking global consensus "There are a lot of different countries, so you need a high level of consensus and that is not easy" Director (research institute)
	Low virgin material prices "Low prices of many virgin materials" Mont et al. (2017, p.28)
	Lacking standardization "There is a lack of standards" Scholar (university)
Technological Lacking (proven) technologies to implement CE	"High upfront investment costs" Mont et al. (2017, p.29)
	Limited funding for circular business models "Financing of circular business propositions" Pfeffer (2017, p.14)
	Lacking ability to deliver high quality remanufactured products "Limited availability and quality of recycled materials" BMSA (2013, p.4)
	Limited circular design "Products are not designed for circular business models" Mont et al. (2017, p.30)
	Too few large scale demonstration projects "Limited application of new business models" BMSA (2013, p.4)
	Lack of data, e.g. on impacts "Lack of data" Pfeffer (2017, p.14)



LITERATURE REVIEW

ENABLERS

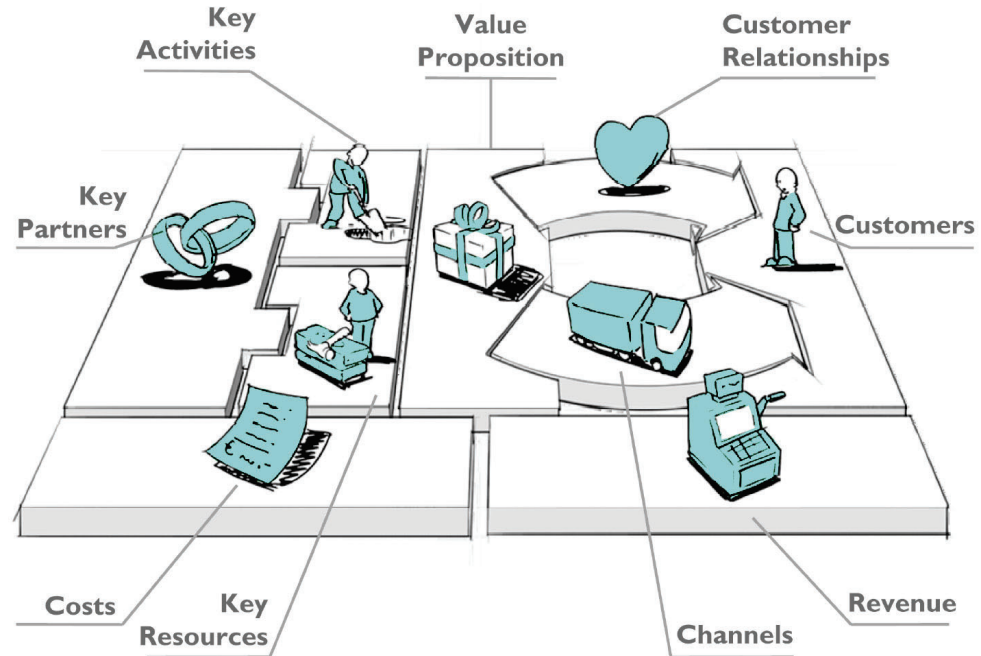


EXPLORE



EXPLORE

CASE STUDIES



MITSUBISHI

SIGNIFY

CHAINABLE



EXPLORE

CASE STUDIES RESULTS

MITSUBISHI

26 BARRIERS

22 ENABLERS

SIGNIFY

21 BARRIERS

17 ENABLERS

CHAINABLE

18 BARRIERS

23 ENABLERS

SYNTHESIS



SYNTHESIS

OVERVIEW



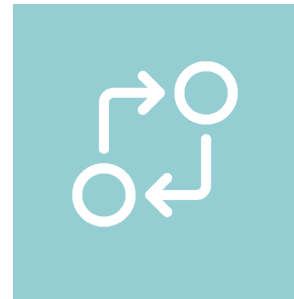
Comparison

Theory
vs
Cases



Filter

Barriers
&
Enablers



Relations

Finance
Legal
Organisation



Overview

Common
&
Effectiveness



SYNTHESIS

EXAMPLE

Category	Barriers Theory
Financial	Low virgin material prices
	lacking standardization
	High upfront investment costs
	Limited funding for circular business models
	Lack of data
	Cash-flow problems
	Difficulty defining which party pre-finances
	High investment risk due to the long lease period
	Service is more expensive in the long term than buying

Barriers Mitsubishi
Way of pre-financing
VAT extension on product
limited own resources
Intensive trying get contract with a bank, will not be a perfect fit
calculate end value, how to enlarge



SYNTHESIS

GENERAL REMARK

- Literature has a **general** approach
- Practice has a **product-specific** approach



SYNTHESIS

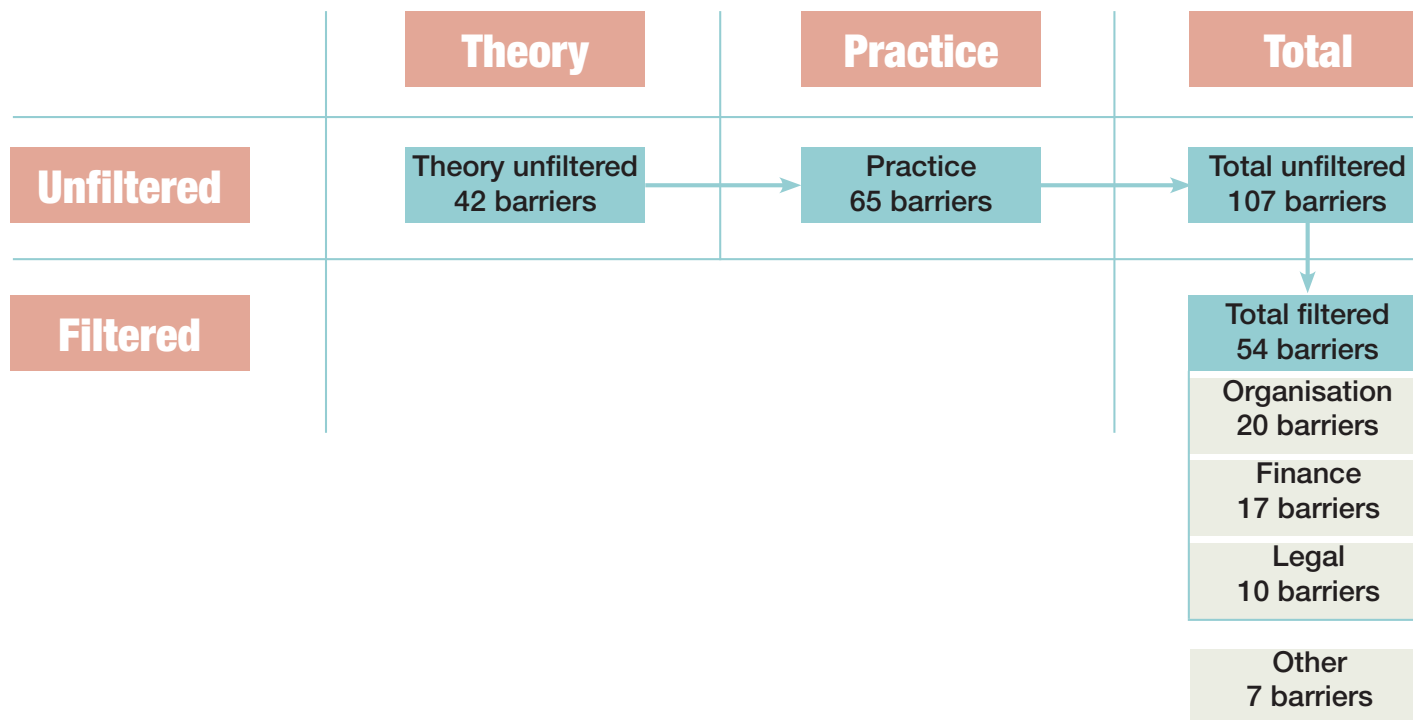
EXAMPLE

Organisational barriers		Times mentioned					
OB1	Hesitant company culture						
OB2	Limited willingness to collaborate in the value chain						
OB3	Lacking consumer awareness and interest						
OB4	Operating in a linear system						
OB5	Conservative industry						
OB6	lack of support from senior management						
OB7	Lacking expertise						
OB8	Lack of strategic planning						
OB9	Lack of an ideal management information system						
OB10	Existing company changing into a new way						
OB11	longer trajet with partners (compared to just selling)						
OB12	New unfamiliar stakeholder involved						
OB13	Multiple departments need to be managed and work together						
OB14	Providing certain services is not companies key activity						
OB15	Getting in touch with key partners is difficult						
OB16	Every segment has it own demands/needs						
OB17	Different go to markets, with different strategies needed						
OB18	As a start-up, you need to grow with the company and sales						
OB19	the traditional market is filled by long-existing companies with existing client relations						
OB20	Good PaaS concept needs to grow exponentially, otherwise will be copied by others						



SYNTHESIS

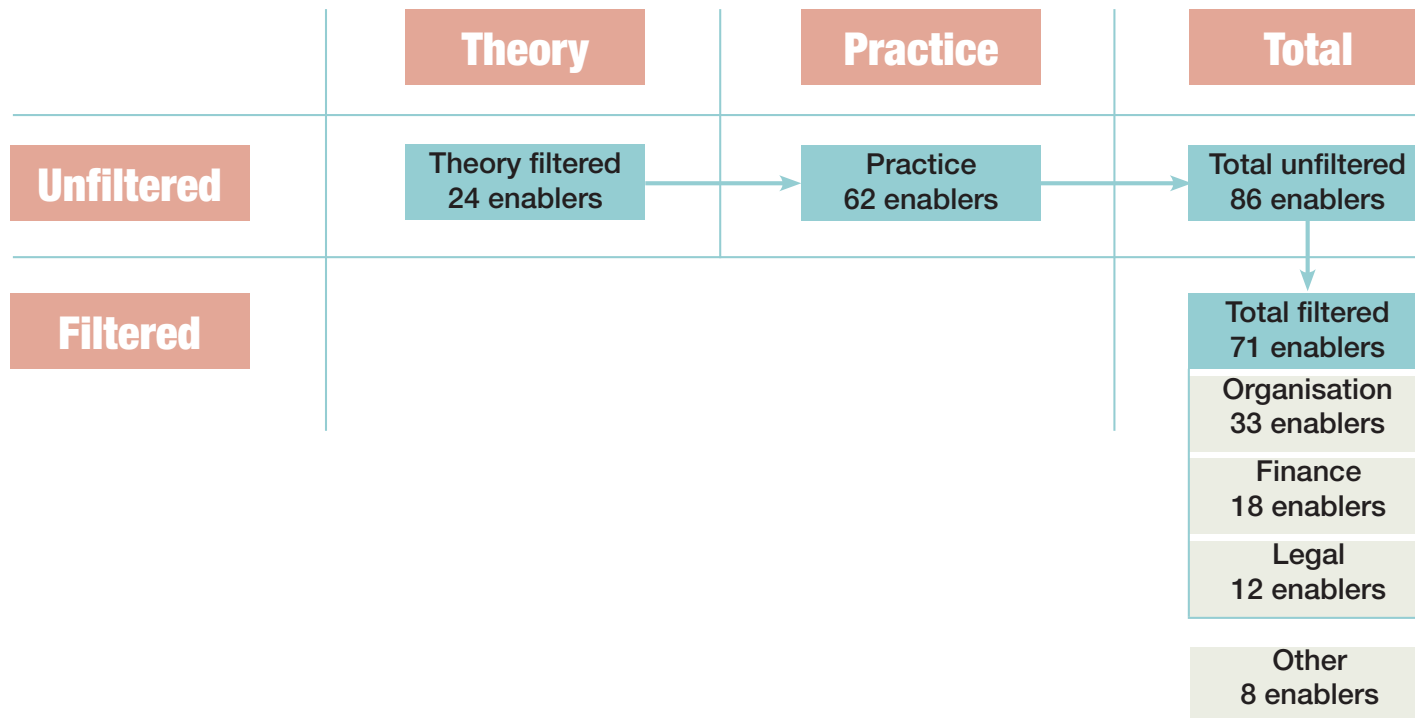
GENERAL RESULTS





SYNTHESIS

GENERAL RESULTS





SYNTHESIS

GENERAL REMARK

Barriers went from **107** to **54** after filter

Enablers went from **86** to **71** after filter

Enablers from theory don't have to be filtered

Enablers are more product-specific and show more differences



SYNTHESIS

ORGANISATION

Organis	OE1	OE2	OE3	OE4	OE5	OE6	OE7	OE8	OE9	OE10	OE11	OE12	OE13	OE14	OE15	OE16	OE17	OE18	OE19	OE20	OE21	OE22	OE23	OE24	OE25	OE26	OE27	OE28	OE29	OE30	OE31	OE32	OE33	results
OB1																																		0
OB2																																		0
OB3																																		0
OB4																																		0
OB5																																		0
OB6																																		0
OB7																																		0
OB8																																		0
OB9																																		0
OB10																																		0
OB11																																		0
OB12																																		0
OB13																																		0
OB14																																		0
OB15																																		0
OB16																																		0
OB17																																		0
OB18																																		0
OB19																																		0
OB20																																		0
Results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SYNTHESIS

FINANCE





Finance	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15	EF16	EF17	EF18	Results
BF1																			0
BF2																			1
BF3																			6
BF4																			5
BF5																			2
BF6																			5
BF7																			5
BF8																			8
BF9																			1
BF10																			0
BF11																			7
BF12																			4
BF13																			0
BF14																			1
BF15																			3
BF16																			2
BF17																			1
Results	3	4	5	5	2	3	1	0	5	3	3	1	2	3	4	2	5		



SYNTHESIS

LEGAL

Legal	EL1	EL2	EL3	EL4	EL5	EL6	EL7	EL8	EL9	EL10	EL11	EL12	Results
BL1													1
BL2													3
BL3													0
BL4													0
BL5													3
BL6													7
BL7													5
BL8													3
BL9													3
BL10													3
Results	2	2	2	1	2	3	2	4	3	3	3	3	1

-  **Most effective enablers**
-  **Correlation**
-  **Most addressed barrier**
-  **No correlations**



SYNTHESIS

GENERAL REMARKS

- An **overview** of the most common barriers and most effective enablers can be made.
- The **most common barriers** can be deduced from the number of mentions during the research.
- The **most effective enablers** are found by looking at the effectivity of an enabler.

VALIDATION



VALIDATION

- The **ranking of the barriers** shows that (product-)specific barriers are placed **higher** than the **general** barriers.
- The **ranking of the enablers** has the **opposite**, with general enablers first and product-specific enablers as last.

FINDINGS

FINDINGS

RESEARCH FINDINGS

- Theory
- The **general approach** of literature in **comparison** to the **product-specific approach** of practice
- The ranking by practice gives **more insight** on literature

CONCLUSIONS

CONCLUSIONS

RESEARCH SUQ-QUESTIONS

What is a Product-as-a-Service business model?

The concept of a Product-as-a-Service (PaaS), is defined as the **offering of a product**, by **selling the functional result** rather than the object itself

A business model is seen as a **conceptual tool**, which allows to express the business logic of a company. The business model contains a **set of elements** and the relations between them. With the set of elements, a **description of the value** of a company is presented.

To **conclude**, a PaaS business model can be defined as a **business model** which **contains** one or multiple **PaaS value propositions** with an integrated offering of products and services and has a **revenue mechanism** based on selling availability, usage or performance.

CONCLUSIONS

RESEARCH SUQ-QUESTIONS

Which **barriers are identified in the implementation of a PaaS business model in the Dutch built environment from a theoretical and practical perspective?**

Total filtered 54 barriers
Organisation 20 barriers
Finance 17 barriers
Legal 10 barriers

Which **enablers are identified to overcome the barriers when implementing a PaaS business model in the Dutch built environment from a theoretical and practical perspective?**

Total filtered 71 enablers
Organisation 33 enablers
Finance 18 enablers
Legal 12 enablers

CONCLUSIONS

RESEARCH SUQ-QUESTIONS

Which barriers and enablers are the most important for the implementation of the PaaS business model in the Dutch built environment?

The most important **barriers** within the three main aspects are according to experts;

- “Every segment has its own demands/needs (need to be inventoried)”
- “Cash-flow problems”
- “Retaining ownership”

The most important **enablers** within the three main aspects are according to experts;

- “Focus on 1 or 2 go-to markets”
 - “Contract with investor”
 - “Incorporate all legal barriers in contract”
-

CONCLUSIONS

RESEARCH SUQ-QUESTIONS

However...

The **remark** needs to be made, Each company and each product has its **own** barriers and therefore its own enablers. Thus, the question and situation will **vary** for each company and cannot be answered with one answer. By giving **a ranking and main conclusion on the importance** of the barriers and enablers, an **indication** can be given for the companies.

CONCLUSIONS

MAIN RESEARCH QUESTION

HOW TO OVERCOME THE BARRIERS WITH RESPECT TO THE FINANCIAL, LEGAL AND ORGANISATIONAL ASPECTS OF IMPLEMENTING A PRODUCT-AS-A-SERVICE BUSINESS MODEL WITHIN THE DUTCH BUILT ENVIRONMENT?

Two ways support the primary research aim. First, the identification of barriers. Secondly, the relation between barriers and enablers.

CONCLUSIONS

LIMITATIONS

- **THEORY**

- Broad concept of PaaS
- Rapid changing literature

- **PRACTISE**

- Limited amount of companies
 - Suppliers, developers & investors are not taken into perspective
 - Different types of companies
-

CONCLUSIONS

RECOMENDATIONS

- **FUTURE APPLICATION**

- The application of the output

- **FUTURE RESEARCH**

- The practical perspective
 - The perspective of all the actors
 - The scope of the research
 - The types of companies
-

QUESTIONS?
