Some reflections on (Dutch) STI policies from a researchbased consultant perspective



Guest lecture MSc Public Policy & Human Development, course on STI Policy, 23<sup>rd</sup> May 2019, Maastricht

Dr. Pim den Hertog



## Goal of this guest lecture

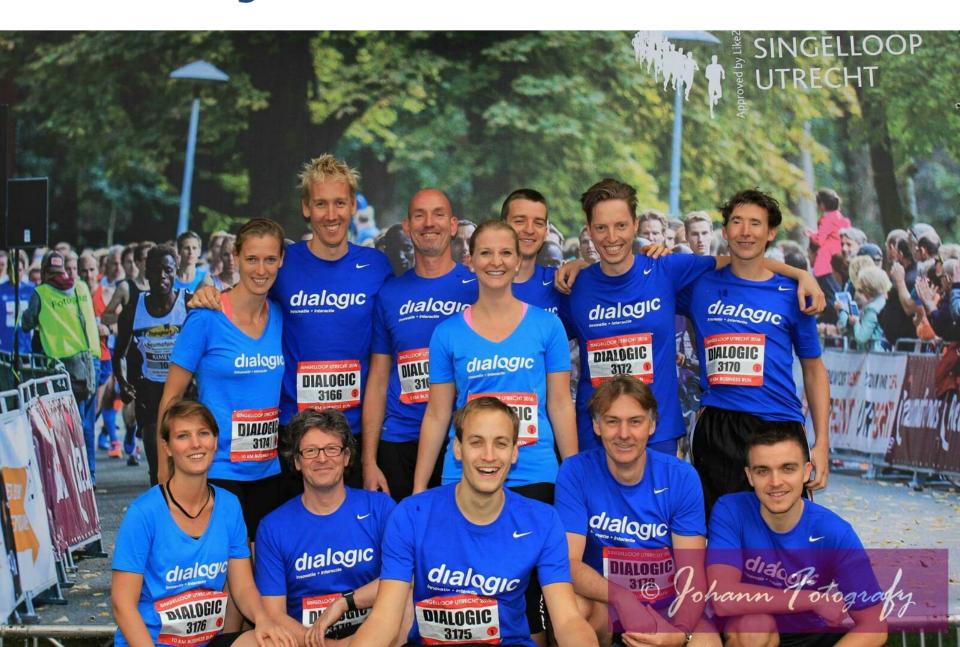
- ✓ Give you an insight in some typical assignments
- ✓ Discuss the results of selected recent projects
  - ➤ Meta review Dutch Entrepreneurship and Innovation Policies (2015) (II)
  - > Evaluation Innovation Box (2015) (III)
  - ➤ Evaluation Topsector approach (2017) (IVa) or Policy Experiment Service Design Voucher (2018)
- ✓ Reflect on the interaction between policy-makers, steering committees & consultant →10 ways to spoil an evaluation (V)
- ✓ Start with topic service innovation & two key models (I)

## **Introducing Dialogic**

- Independent research consultancy (since 1998, roots TNO)
- ± 25 researchers/consultants
- Turnover: 2 mln.
- Domains:
  - Digital connectivity
  - Innovation policy & management
  - Education & labour market (mobility)
  - Information strategy (Big Data)
- Dominant focus on Dutch and Flemish markets, increasingly EU & OECD
- > Clients:
  - Ministries
  - Intermediaries
  - Sector organisations
  - Institutes
  - Large firms
- Strong collaborations with Dutch universities



## Dialogic Innovation & Interaction



## Some Clients & Projects...































































# dialogic

Innovation strategy and policy for (semi-)public organisations



## **Introducing myself**

- ✓ MA Economic Geography (1990, Utrecht)
- ✓ PhD Business studies (2010, Amsterdam)
- √ 1990 1998: TNO Centre for Technology and Policy Studies
- √ 1998 now: Partner Dialogic Innovation & Interaction
- ✓ 2008 2012: University of Amsterdam, Amsterdam Centre for Service Innovation

### Some recent assignments

- ✓ Supporting Tax Authorities writing an OECD book on TSPs (2016)
- ✓ Evaluation of 3 strategic research centres for Flemish EWI (2016) & support evaluation of 5 Dutch applied research institutes (2017)
- ✓ Evaluation of TKI-scheme & evaluation of Topsector approach (2016-2017) for Min of EA
- ✓ Evaluation of Innovation Box (2016) and 30% scheme/Ex-pat scheme (2017) for Ministry of Finance
- ✓ Two policy experiments on service-based business model innovation for Min of EA (2016-2018) & Servitisation study EU (2017-2018)
- ✓ Supporting Eurostat in revision of Oslo Manual on measuring innovation (2017-2018)
- ✓ Supporting RWS in analyzing the scope of innovative procurement policies (2017-2018)
- ✓ Evaluation Valorisation programme EZK/OCW (2018) and evaluation WBSO (2019)



## Setting the scene (1)

A small sample of service innovations







Sustainable mobility plan (leasing)



Design your own life (retailing)



Randstad (staffing industry/HR services)



Shoe Box service by Insinger de Beaufort (banking)



Supperclub (hospitality industry)

## **Setting the scene (2)**

#### Peculiarities of service innovation

- ✓ Conceptual character / intangibility
- ✓ Shared or co-produced process / client intensity
- ✓ Highly combinatory / architectural

## Setting the scene (3) Three perspectives on service innovation

- ✓ Assimilation approach
- ✓ Demarcation approach
- ✓ Synthesis/systemic approach

NB: these perspectives can be observed in theoretical, empirical and policy approaches towards service innovation

## Two core problems (1)

- ✓ Lack of appreciation of the idiosyncratic character of service innovation → 6D service innovation model
- ✓ Missing firm-level managerial perspective on service innovation ⇒ strategic framework with 6 dynamic service innovation capabilities for managing SI

## 6D service innovation model (1)

Service innovation literature is patchy, partly overlapping, but also developing in splendid isolation

- 1. Marketing and service management dominated tradition
- 2. New Service Development (NSD) tradition
- 3. Service Innovation Tradition (incl Lille & Manchester schools)
- 4. Interdisciplinary tradition (Normann, Edvarsson, Sundbo)
- Most literature is partial, does not appreciate the multidimensionality of SI, is still too much product-based and linear and does not provide a managerial perspective on SI
- We started from 3, develop towards 4 (benefitting from 1) and most importantly infused it with RBV/DCV (clear management perspective, but lacks a service sensitivity)

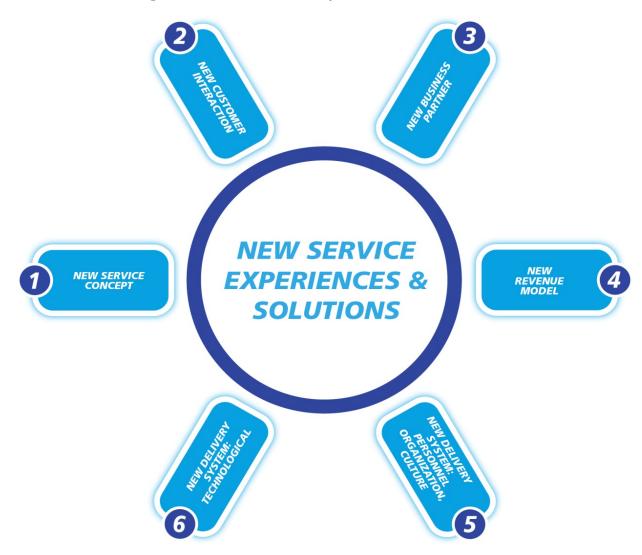
## **6D** service innovation model (2)

Importance of multi-dimensionality and org. innovations

- New service concept
- 2. New customer interaction
- 3. New business partner
- 4. New revenue model
- 5. New delivery system: personnel, organization, culture
- 6. New delivery system: technological

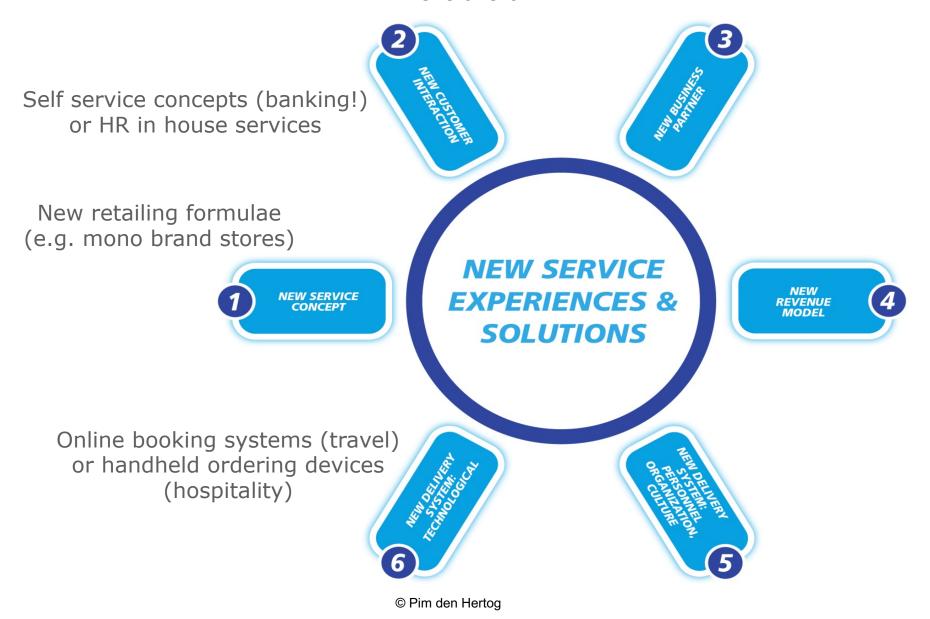
## 6D service innovation model (3)

Creating new service experiences and solutions



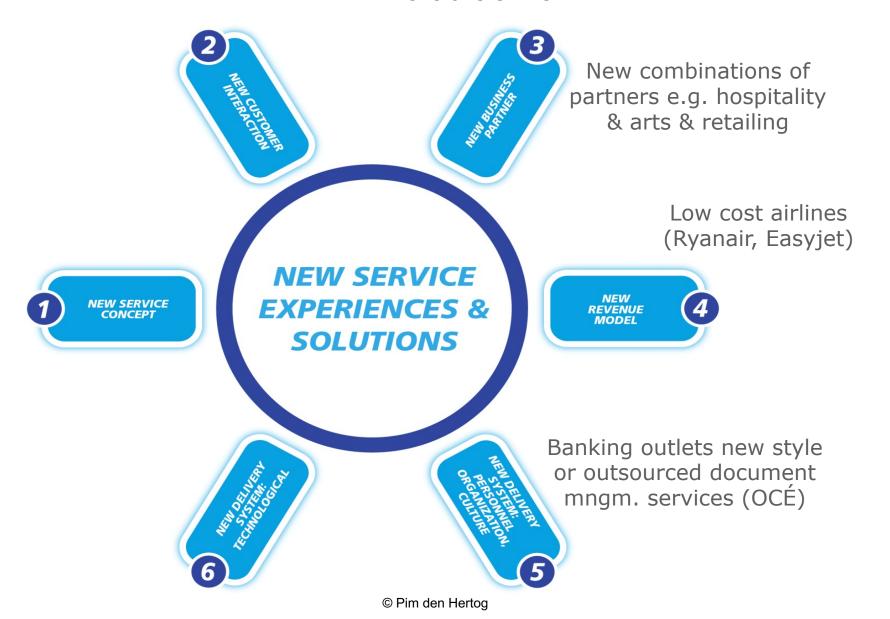
## 6D service innovation model (4)

Dimensions 6-1-2



## **6D** service innovation model (5)

**Dimensions 3-4-5** 



## 6D service innovation model (6)

Defining service innovation, (den Hertog, 2010)

A service innovation ...

... is a new service experience or service solution in one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system.

## **6D** service innovation model (7)

Defining service innovation, (den Hertog, 2010)

#### Criteria:

- ✓ New service, service portfolio and/or service process
- ✓ Reproducible (not unique client-specific solutions)
- ✓ Intentional and systematic efforts
- ✓ Certain degree of newness (or radicalness)
- ✓ Introduced and diffused on the market with (some degree of) success in the market

## 6D service innovation model (8)

In conclusion

- ✓ Soft (mostly organisational) sides of innovation still too often ignored
- ✓ Underestimation of the multidimensionality and complexity of many service innovations
- ✓ 6D-model tool for mapping (afterwards) and more pro-actively working on service innovation

## Firm capabilities for managing SI (1)

Service innovation process characteristics

- ✓ Multi-dimensionality
- ✓ Interdisciplinary
- ✓ Multi-party
- ✓ Multi-site

Distributed & concurrent service innovation process (rather than concentrated and linear R&D process)

## Firm capabilities for managing SI (2)

How RBV/DCV of the firm may help to address the missing firm level managerial perspective on managing service innovation

- Address the 2nd core problem i.e. a missing firm-level managerial perspective on service innovation
- Infuse the service (innovation) management literature with insights from strategic management litt esp RBV/DCV of the firm

## Firm capabilities for managing SI (3)

Operational and dynamic capabilities

- Operational or zero-order capabilities: "how we earn a living now capabilities" (Winter, 2003) or "the capability of an organization to perform an a coordinated set of tasks utilizing organizational resources for the purpose of achieving a particular end result (Helfat and Peteraf, 2003) i.e all the off the shelf capabilities to survive business wise (following Teece: technical fitness)
- Dynamic capabilities: "capabilities that would change the product, the production process, the scale or the customer (markets) served" (Winter, 2003) or "the capacity to sense and shape opportunities and threats, to seize opportunities and dynamic capabilities to maintain competitiveness through enhancing, combining, protecting, and, when necessary reconfiguring the business enterprise's intangible and tangible assets" (Teece, 2007, to realise evolutionary fitness)

## Firm capabilities for managing SI (4)

Dynamic service innovation capabilities: a definition

Those hard to transfer and imitate higher order service innovation capabilities which firm possess to develop, (re-) shape, (des-)integrate and (re-)configure existing or new resources and operational capabilities. These are needed to successfully offer existing and potential clients a new service experience or solution and market them in a sustainable fashion, hence swiftly adapting to a firm's changing environment. These dynamic service innovation capabilities are aligned with firm strategy, market dynamics and firm history. (p. 131)

## Firm capabilities for managing SI (5)

Equifinality & room for mutual learning

- ✓ ...combination of dynamic SI capabilities used for managing SI will
  differ between individual service innovators (equifinality)
- ✓ ...there is good practice & room for mutual learning (but always a firm specific twist in the detailing)

## Firm capabilities for managing SI (6)

6 dynamic SI capabilities/organizational routines

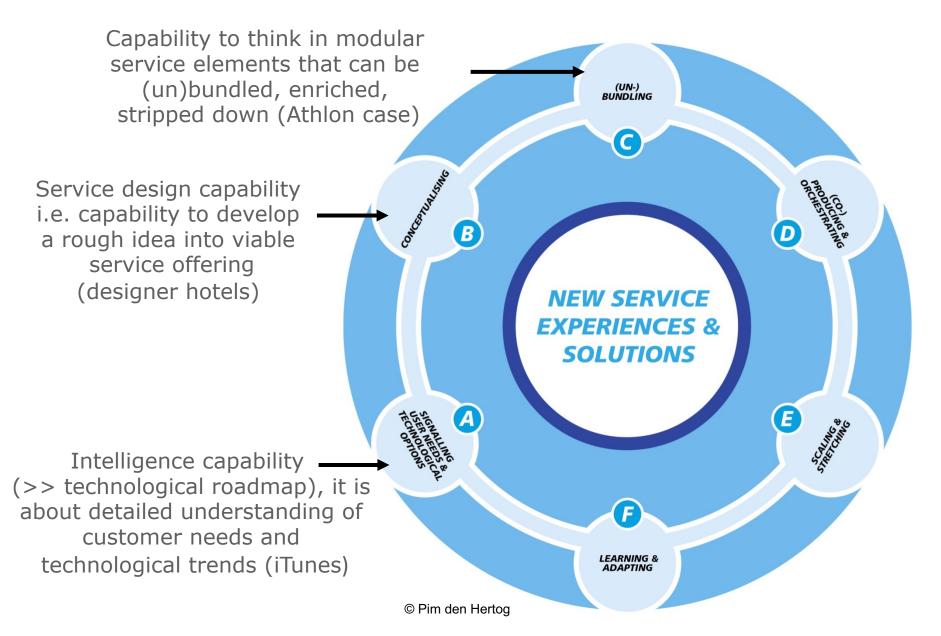
- A. Signaling user needs & tech. options
- B. Conceptualizing / service design
- C. Bundling & unbundling
- D. Co-producing & orchestrating
- E. Scaling & stretching
- F. Learning & adapting

## Firm capabilities for managing SI (7)

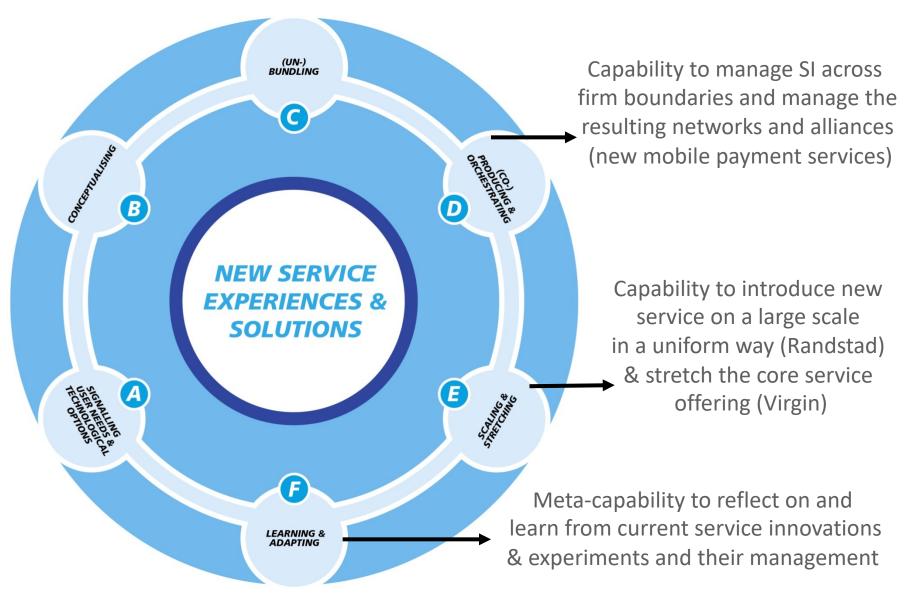
6 dynamic service innovation capabilities



## Firm capabilities for managing SI (8)



## Firm capabilities for managing SI (9)

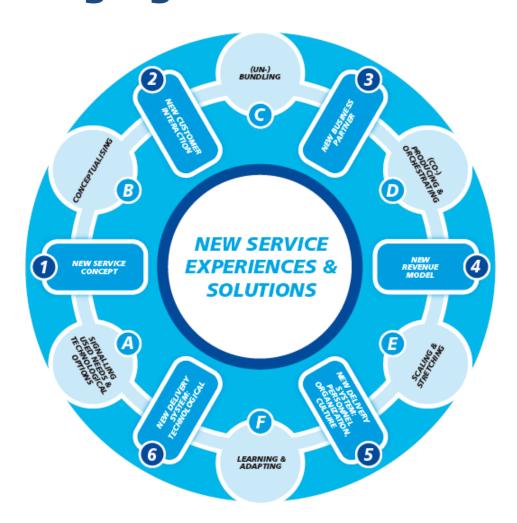


## Firm capabilities for managing SI (10)

#### In conclusion

- ✓ SI process (though distributed) can be managed more deliberately & systematically
- ✓ Successful service innovators create mixes that are:
  - firm specific
  - difficult to imitate/copy (and constantly adapted)
  - aligned with firm strategy
  - not necessarily all owned by the firm
- ✓ 6 dynamic SI framework is a management tool to reflect and to assess where does the firm excel, where does the firm need to improve, which capability to let go or buy on the market

# Integrated framework for strategically managing service innovation



## My questions to you

- 1. Are any of the two models possibly relevant in your studies and in your work?
- 2. Can you think of cases in which you would use the two models?
- 3. What do you miss in the two models?

Q & A

Dr. Pim den Hertog (denhertog@dialogic.nl)

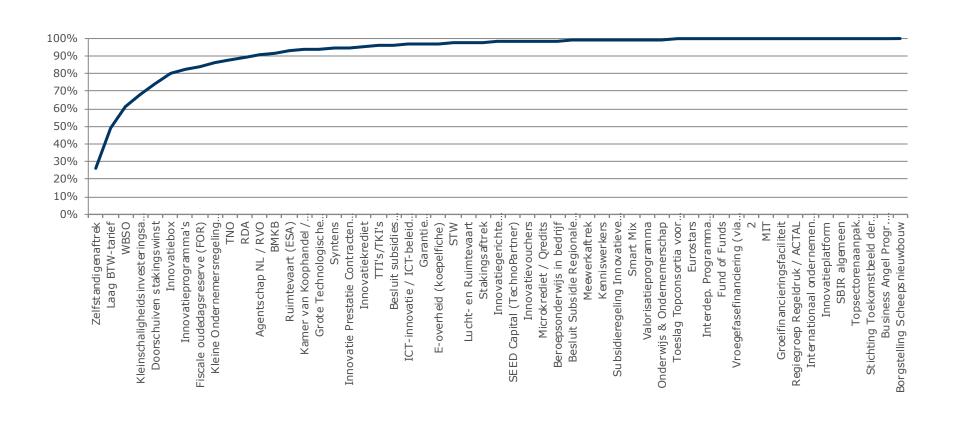
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# **PART II Meta-review Dutch Entrepreneurship and Innovation policymix**

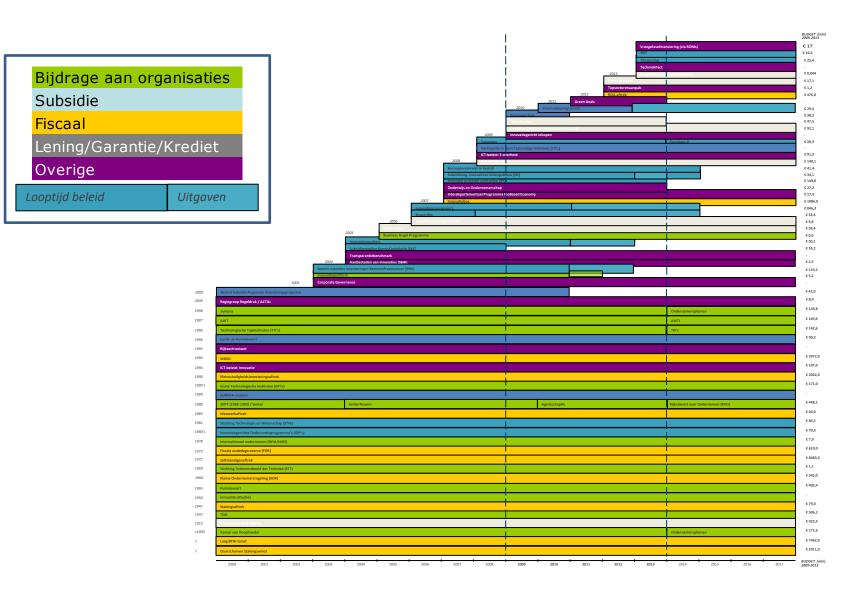
# ... a highly skewed distribution in terms of budget



#### How the 65 instruments fit into the logical policy framework used

Multi-factor productiviteit (MFP)				Energie- grondstof &	
Innovatie	Marktcondities / ondernemerschap	Menselijk kapitaal	Kapitaalverdieping	materiaal	
Innovatie-attachés	Agentschap NL / RVO	Kenniswerkers	Intern. Ondernemen (NFIA)	IP Biobased Economy	
Syntens	KvK / Ondernemerspleinen	Onderw. & Ondern.schap	Microkrediet	Green Deals	
CT-innovatie	E-overheid	Beroepsonder. in bedrijf	ВМКВ		
Innovatiegericht inkopen	Transparantiebenchmark	Techniekpact	Groeifaciliteit		
BIR-aanpak	Corporate Governance		GO		
ucht- en ruimtevaart	Ambitieus ondernemerschap		Fund of Funds		
nnovatiekrediet (& UK)			VFF		
/alorisatieprogramma			SEED Capital		
Subsr. KennisExploitatie			<b>Business Angel Program</b>		
Subsr. Innov. Scheepsb.	Rijksoctrooiwet		Borgst. Scheepsnieuwbouw	_	
Ruimtevaart, ESA	Regiegr. Regeldruk/Actal		BSRI		
AWTI					
INO					
GTI's					
ΓΤΙ's/TKΙ's					
Int. Innoveren: JTI's					
Int. Innoveren: EUREKA					
Eurostars					
Innovatieprogramma's					
nnovatieplatform					
Smartmix					
STW (incl Valorization Grant)					
SSIK					
IOP's					
STT					
IPC				Legenda (artike	
Innovatievouchers				RVO-activiteiten (12/1	
Горsectorenaanpak				Ondernemerspleinen (1	
ΓKI-toeslag				ICT-beleid (1	
MIT				TechnoPartner (1	
RDA	Zelfstandigenaftrek		Kleinschaligheids-invest.aftrek	•	
WBSO	Fiscale oudedagsreserve		-	Onderzoeksinstituten (1	
Innovatiebox	Meewerkaftrek			Internationaal innoveren (1	
	Stakingsaftrek			Programmatische aanpak (1	
	Doorschuiven stakingswinst			Topsectorenbeleid (1	
	Laag BTW-tarief			Fiscaal beleid (12/1	
	Kleine Ondernemingsregeling			Investeringspakket (1	

#### ... turbulence and continuity



# Main type of policies and their associated budgets



#### Key conclusions I

- #1 EA uses a logical model for framing their I&E-policies based on endogenous growth theory
- #2 EA uses 2 complementary economic perspectives (market failure & system failure perspective) to legitimate intervention & introduced quite a few systemic instruments recently
- #3 Legitimation is rather implicit and incidental, EA can improve on underlying problem analysis for its policies

#### Key conclusions II

- #4 Lot of policies in the policy mix are geared towards spurring I&E in only SMEs
- #5 Need to better address a number of the key trade offs in I&E policies (see next slide) as currently policy discussion is highly skewed
- #6 For the major part of evaluated schemes and policies (some) form of efficacy was established

#### Key conclusions III

- #7 EA has made progress is assessing effectiveness, however trend of systemic policy instruments makes it much harder to assess effectiveness
- #8 Assessments of efficiency of policies are only available for a few schemes (micro > macro efficiency)
- #9 Policy mix: assessment of coherence of total policy mix can be improved upon and increase overall efficiency
- #10 Policy mix: need for better alignment between national and especially EU I&E- policies

#### Typical trade offs in I&E policies

1. Generic	Specific
2. Indirect (fiscal) versus	Direct I&E-policy
3. Special attention for SMEs	No Special attention for SMEs
4. ICT-policy as a specific aspect	ICT-policy integrated in in innovation policy
5. National I&E-policy	EU coordinated I&E-policy
6. Hard innovation/tech/ R&D	Soft side of innovation
7. Spurring overall Entrepreneurship	Focus on ambitious entrepreneurship
8. Split between innovation and entrepreneurship policies	Integrated I&E policies
9. Government as a financing institution	Government as a network partner
10. EA as a specialist department	EA as a department intervening in policy domains of other departments

# Increase in evidence-based policy-making and quantitative evaluations in the Netherlands 2005-2014

Pijler	Evaluaties	Geen evaluaties (2005 – 2014)				
	(2005-2014)	Ander analyseniveau	Nieuw beleid	Tijdelijk beleid	Specifiek beleid	Onbekend
Innovatie	21	1	5	1	1	4
Ondernemerschap / Marktcondities	9	1	0	0	0	4
Menselijk kapitaal	1	1	1	1	0	0
Investeringen	8	0	3	0	0	1
Energie en materialen	2	0	0	0	0	0
Totaal	41	3	9	2	1	9

	Regressie	Descriptief*	Regression discontinuity	Correlatie	Kwalitatief*	Propensity score matching
2005-2012	14%	100%	0%	14%	100%	0%
2013-2014	42%	100%	25%	25%	100%	8%

<sup>\*</sup> Type analyse dat buiten het Theeuwes rapport valt.

### Q & A

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SOMETICETHING

#### **PART III**

### **Evaluation Innovationbox**

[in cooperation with Bart Verspagen and Pierre Mohnen, most slides from a presentation by Bart Verspagen]

#### The specific context of our study

- ✓ Evaluation of the Innovation Box (Patent Box) scheme in the Netherlands
- ✓ Official study commissioned by the government (Ministry of Finance)
- ✓ Joint effort Dialogic & UNU-MERIT

#### Innovation box – the policy context

- ✓ Profits from immaterial assets that result from innovation activities are subject to a low (5%) rate of corporate income tax
- ✓ Initially (2007) only formal IPRs (patents) qualified, in 2010 also projects that the tax office qualifies as R&D
- ✓ Dual goal: 1) stimulate risky R&D by increasing the payoffs; 20 improve fiscal climate for R&D firms
- ✓ Comes in addition to another fiscal R&D policy (WBSO/RDA), for wage costs for R&D

#### **R&D** and **I-box** budget

✓ Costs of the Innovation box are foregone taxes (€697 million in 2012, the budget for WBSO was €864 million in 2012)

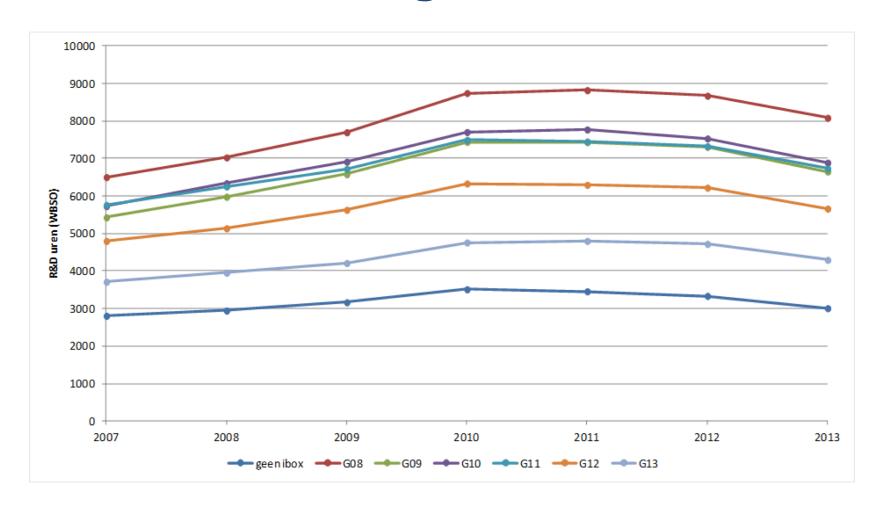
✓ Total BERD in NLD was 5,500 million in 2012

✓ Previous evaluations of the WBSO set high expectations:
 I-box could account for one quarter of total business
 R&D (and WBSO for 30%-points more)

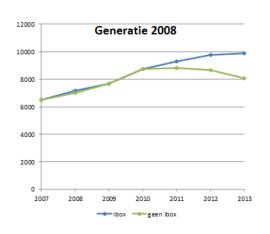
#### Main conclusion (in practice)

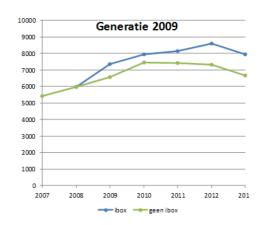
- ✓ Most interest in Bang-for-the-buck (BFTB) how much extra R&D per € foregone tax income?
- ✓ BFTB for 2008-2012 = 0.54 (prime estimate) or 0.34 (alternative specification)
- ✓ Innovation box does lead to extra R&D by Dutch firms, but the effect differs between types of firms
- ✓ Our best estimate says that at most about 7% of total Dutch business R&D may be attributed to Innovationbox (2012)

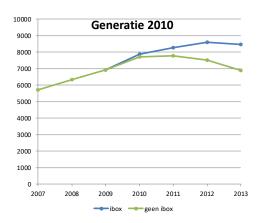
# A graphical view of the differences between generations

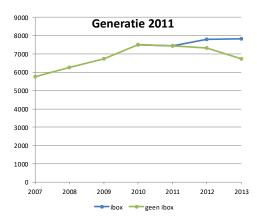


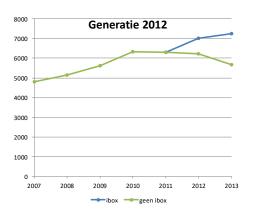
### A graphical view of the estimated effects

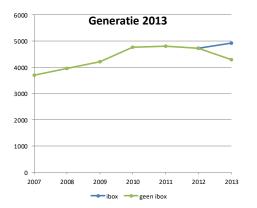












#### Other conclusions

- ✓ Number and "budget" of Ibox has grown strongly since 2010 and is mostly used by R&D intensive large firms (=new information!)
- ✓ For most Ibox used WBSO > Ibox
- ✓ For most firms R&D ticket (formal IPR ticket) is used to qualify for Ibox
- ✓ Probably Ibox contributes to additional innovation output (based on econometrics and literature review)
- ✓ Ibox contributed to reduction of effective corporate task rate, so contributing to competitive investment climate (not sole factor though!)

#### Other conclusions

- ✓ Ibox contributes to reduction of effective corporate tax rate, so contributing to competitive investment climate (not sole factor though! & race to bottom)
- ✓ Most users satisfied about implementation of the scheme by Tax authorities, although...
- ✓ Important share of users and non-users still perceive as a complex scheme
- ✓ Efficient scheme (user perspective): costs for firms approx. 2.6 eurocent per euro foregone tax income
- ✓ Efficient scheme (gov. Perspective): less than 0.5 eurocent per euro foregone tax income

#### **Discussion**

- ✓ Administration of the schemes was very limited
- ✓ Two goals that cannot be evaluated in the same way!
- ✓ Dependence of data availability and choices made in econometric modelling
- ✓ Focus in steering committee & parliament on BFTB
- ✓ Difficulty in getting the other messages across
- ✓ Interest in policy suggestions limited (explosion in use, possibility of capping the scheme, lack of administrative data)

### Q & A

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### PART IV-a

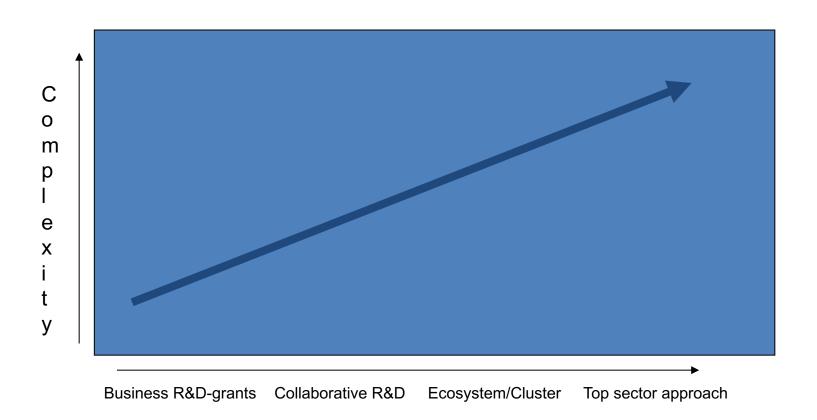
Evaluation of the Topsector approach

(slides taken from a presentation by our principal – Dr. Henry van der Wiel/ Min of EA – for OECD)

# Top sector approach (TSA): modern industry policy

- ✓ Selective: 9 top sectors => knowledge-intensive (R&D), export oriented, potential to make important contribution solving societal challenges worldwide
- ✓ Bottom up/demand-driven: comprehensive sector agenda's through public private partnerships (knowledge industry government):
- ✓ Policy mix/multi-instrumental
  - ✓ Innovation (specific instruments, agenda's for user inspired (collective) research)
  - ✓ Human capital (Human Capital agenda, focus on supply of sufficient S&T-graduates)
  - ✓ Regional involvement (campuses, cooperation central government & regions)
  - ✓ Internationalization (trade missions, economic diplomacy)
  - ✓ Regulation (remove specific regulatory barriers, introduce incentives)

#### **Evaluation TSA:** a challenge



#### **Need for new evaluation framework**

- ✓ Internationally, no evaluation techniques are yet available
- ✓ Therefore, Dialogic i.c.w. Harvard Kennedy School for Public Policy developed a new framework
  - ✓ See Janssen (2016): What bangs for your bucks?, CID-paper no 69.
- ✓ Transformative policies like TSA is about adapting socioeconomic systems to open opportunities for a set of new technologies
- ✓ The framework assesses how much policy contributed to changes or transitions in these technological innovations systems (TIS)

#### Evaluation framework: bird's eye view

Policy design

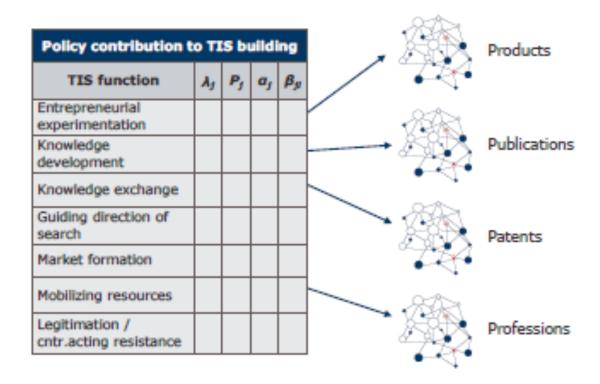


Changing sociotechnical system



Changing economic / knowledge structures

	Design principles
Policy organization	Discipline
	Information retrieval
	Accountability
	Leadership competence
	Open architecture
Po	Genuine novelty
Policy orientation	Inputs, no transfers
	Contrive spillovers



#### **Testing framework on TSA**

- ✓ Impact framework is centre of assessment
  - ✓ Ceteris paribus policy design of TSA
  - ✓ Qualitative assessment, hardly any data
- √ Focus on 8 key functions
  - ✓ What were the main barriers?
  - ✓ What did government do to strengthen function?
  - ✓ What was the impact?
- ✓ How did they do that?
  - ✓ Desk research, literature and interviews

#### Some findings and dilemma's

- ✓ TSA seems to be effective (i.e. more public private partnership) and efficient (i.e. social benefits > social costs)
- ✓ TSA improved the innovation system
- ✓ Observations/dilemma's
  - ✓ Structural changes take time to occur
  - ✓ Differences between top sectors depending on state of technology and quality of the innovation system
  - ✓ Bottom up versus top down => role of government in setting goals?
- ✓ Improvements in policy design of TSA => next phase more focus on societal challenges and goals

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#### Part IV-b

# Service design vouchers for manufacturing SMEs

A policy experiment



Dr. Pim den Hertog



#### Fire fighter or airport safety?

source:Rosenbauer



# Product or serve or product service combination (PSC)?



Power by the Hour Rolls-Royce



Moving people KONE

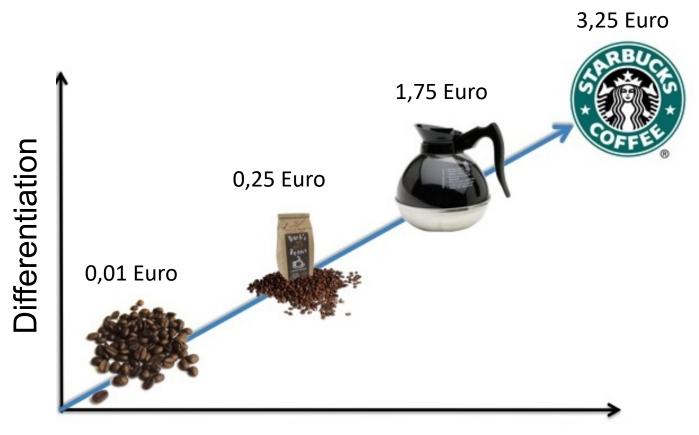


Airport Fire safety
Rosenbauer



Condition monitoring
Anger Machining

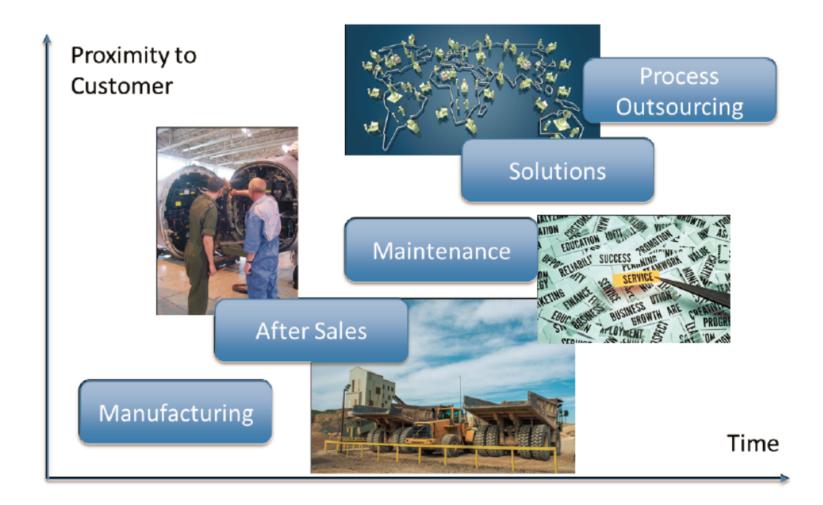
#### Adding service functionality pays off!



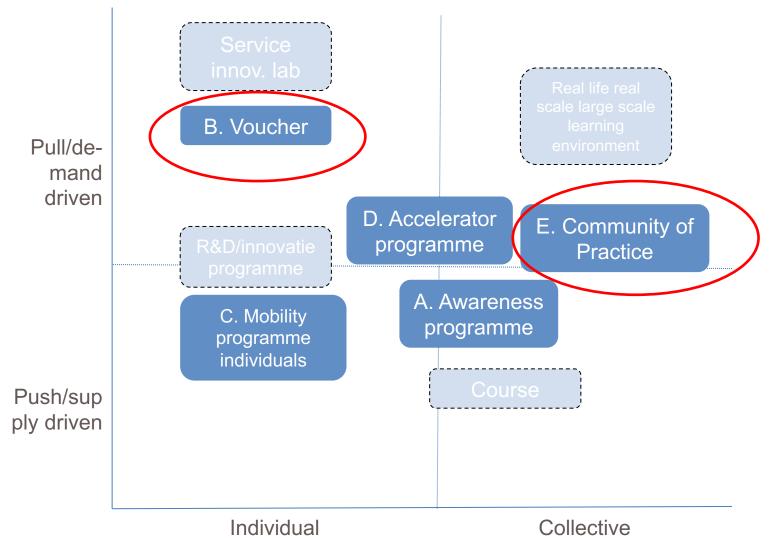
Price per cup of coffee

Commoditisation trap: differentiation against commoditisation (courtesy: Jochem Barth, SSF)

# An increasing number of manufacturing firms add service functionality

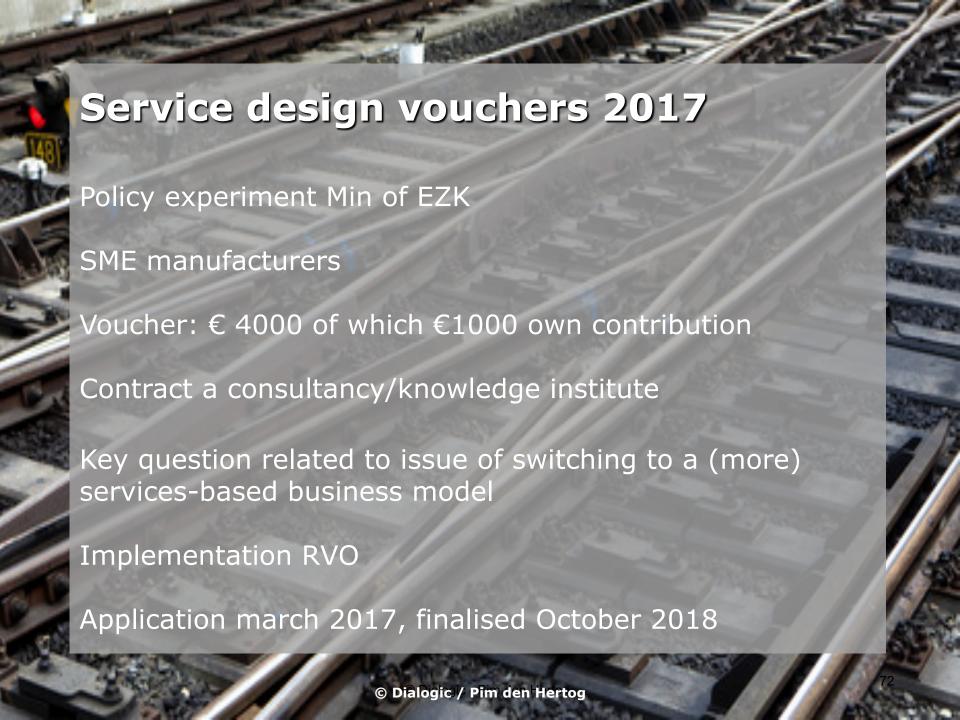


# 2016: 9 possible policy interventions to support servitisation, eventually 2 selected

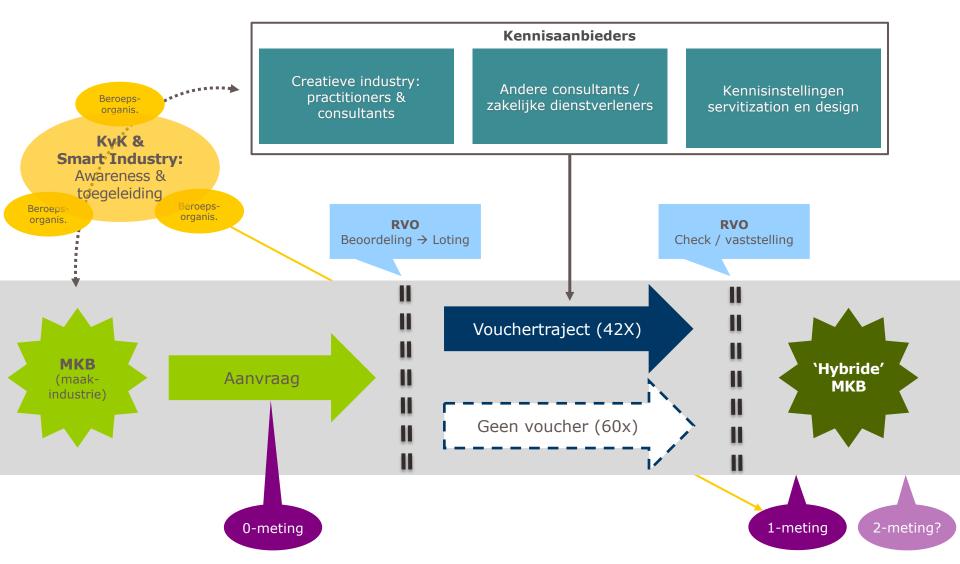


### Options scored on criteria for fine randomised controlled trails

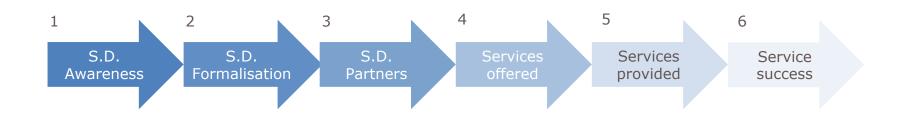
- 1) Possible to differentiate between experimental/treatment and control group
- 2) Results should be measurable
- 3) Reasonable N for reliable
- 4) Time needed for experiment
- 5) Practical feasibility (realistic intevention, addresses a concrete failure/problem)
- 6) Uniformity of the intervention/treatment



# Service Design Voucher experiment: implementation & monitoring



# Policy theory SDV-experiment: Service Innovation Maturity model





#### Service design vouchers 2017

SD-methods such as customer journeys, context mapping, service blueprinting, co-creatiesessions, personas, prototyping

110 applications, 60 granted, 42 actually used

All manufacturing industries

On average size of SME using SDV: 12 FTE

Partly applied through intermediary/knowledge institute

Extensive monitoring & evaluation

#### **Typical questions**

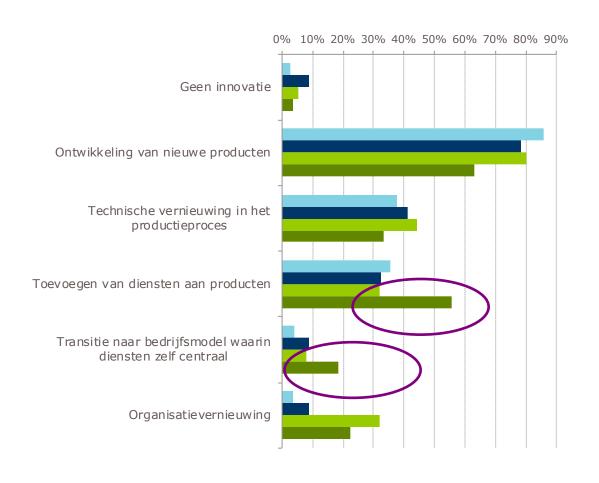
- Switch to preventive maintenance?
- ➤ New revenue model?
- Which after sales services?
- Use of social media in client contacts?
- Mapping user needs?
- How to provide productrelated services?
- Product as a service?
- Circular business model?

#### Typical methods used

- Co-creationsessions
- Persona's
- Customer/buyer journeys
- Context mapping
- Service blueprinting
- > Detailing business plan
- But also more 'regular' market research and strategy advice

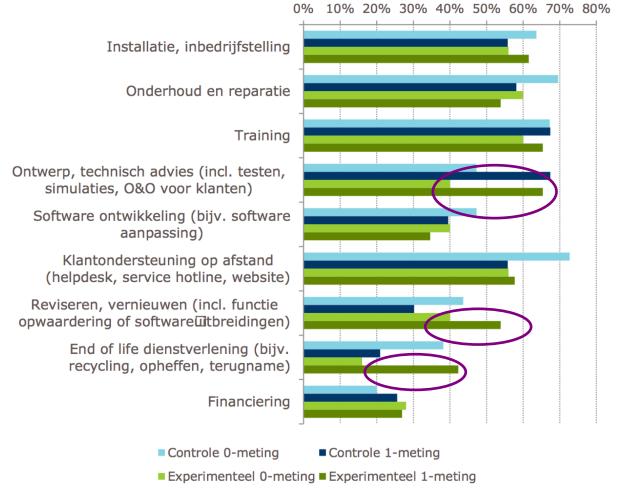
#### Type of innovation realised

### Manufacturing SMEs using SDVs deal with service innovation more intensively



#### Type of product-related service

Manufacturing SMEs with SDV increase their provision of product-related services more often as compared to non-users



### Lessons learned/points for discussion

- # 1 Targetting the right group is challenging
- # 2 SDV mostly used by manuf. SMEs that are aware of their lacking capabilities ('bewust onbekwamen')
- # 3 Formulating a question to be solved by a SDV difficult
- # 4 Effect strongest on awareness and effect on innovation process and firm performance (still) limited
- # 5 Service Design Voucher as an instrument laboursome
- # 6 SDV-instrument possibly too specific
- # 7 Make SDV part of regular voucher schemes?

### Q & A

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