Service Week 2018

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Service Week 2018

Poster Booklet

The Cambridge Service Alliance is a unique global partnership between businesses and universities. It brings together the world's leading firms and academics, all of whom are devoted to delivering today the tools, education and insights needed for the complex service solutions of tomorrow.

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Overview

- **Technical Demonstrators**
  - **Moments of Truth in Services: AI-marketing perspective – Mohamed Zaki**
  - **Blockchain enabling Smart Services: A Prototype – Veronica Martinez**
  - **Uncertainty in Neural Networks: Applications in Manufacturing – Tim Pearce**
  - **Exploratory multi-way data analysis using PCA and PARAFAC applied to injection moulding processes – Flavia Dalia Frumosu**

- **Management Frameworks and Diagnostics**
  - **Developing a Process for Formulating a Digital Transformation Strategy – Mariam Helmy Ismail Abdelaal**
  - **A Multilevel Framework of the Practices Influencing the Performance of Digitally Enabled Construction Projects – Thayla Zomer**
  - **Digital Platform Ecosystem Orchestration in a traditional Industry – Xia Han**
  - **Facilitating Co-creation in Living Labs – Katharina Greve**
  - **Value Capture of Service Business Models - Alexander Moerchel**

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DATA AND ANALYTICS

Moments of Truth in Services: AI-marketing perspective

Actionable framework for making sense of Customer Feedback Data

Touchpoints

1
2
3
4
5
6
7
-
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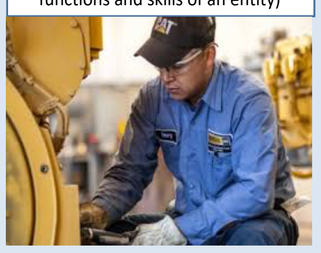
-
-
n

Value Creation Elements

Resources
Core competencies: the fundamental knowledge, systems, functions and skills of an entity)

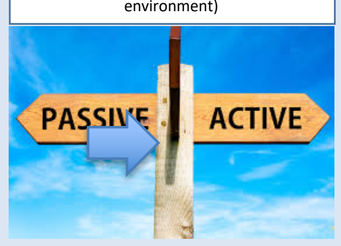


Activities
Performing or doing: cognitive and behavioural)

Context
Situational contexts that can affect a customer's experience positively or negatively)

Interactions
Ways individuals engage with others in their service network to integrate resources)

Customer role
A set of learned behaviours that can be enacted or read from a particular script depending on the specific service environment)

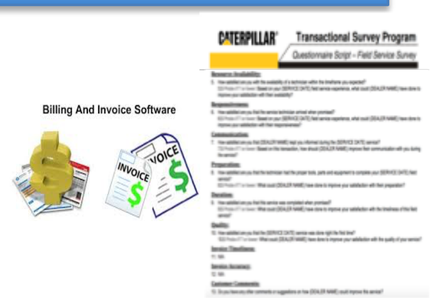


Discrete Emotions

Cognitive Responses

Experience Journey

Pre-purchase stage | Purchase stage | Post-purchase stage



Survey answers

Survey name	Stage	Branch	Time	Result	
Finning Pilot Post-Purchase	postpurchase		2018-09-12 13:42:01	Negative	Details
Finning Pilot Service Execution	purchase		2018-09-12 13:42:53	Negative	Details
Finning Pilot Service Execution	purchase		2018-09-12 13:50:33	Positive	Details
Finning Pilot Service Execution	purchase		2018-09-12 14:17:36	Negative	Details
Finning Pilot Post-	postpurchase		2018-09-12 14:23:42	Positive	Details

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MAKING AND SUSTAINING THE SHIFT TO SERVICES

Blockchain enabling Smart Services: A Prototype

UNIVERSITY OF CAMBRIDGE
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Dr. Veronica Martinez

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Project's Objective

To build a prototype and evaluate the use of a **blockchain** technology to automate demand and supply change in the supply chain between customer & manufacturing site – in the Customer Order Management.

Blockchain

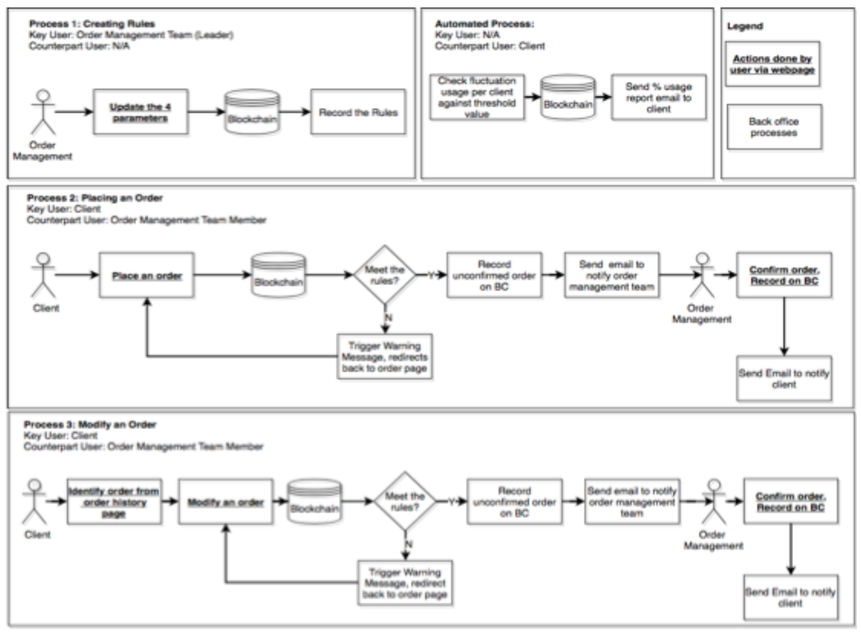
Is a Distributed Ledge also called decentralized Database. It Is an Autonomous Decision Making System that allows P2P Transactions. Typical uses:

- Smart Contract
- Cryptocurrency and Bitcoin

Unique characteristic of Blockchain:

1. Resilience
2. Safety
3. Tractability
4. Irreversibility

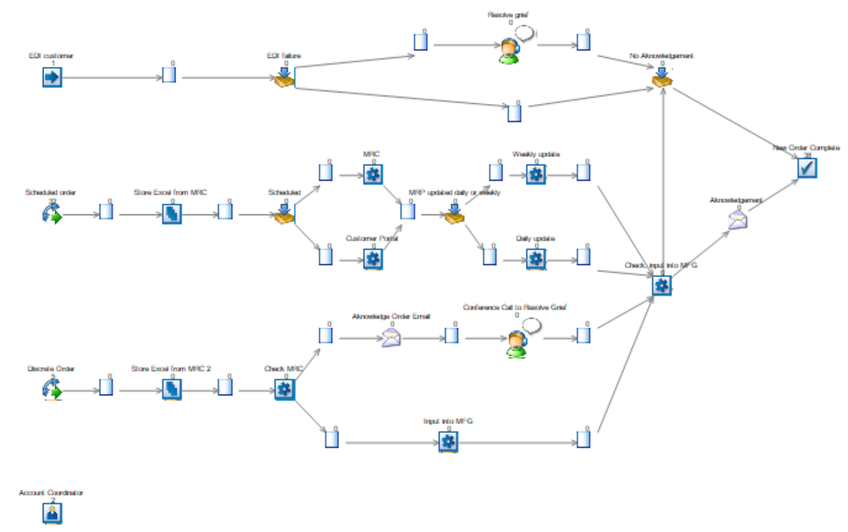
Blockchain Prototype



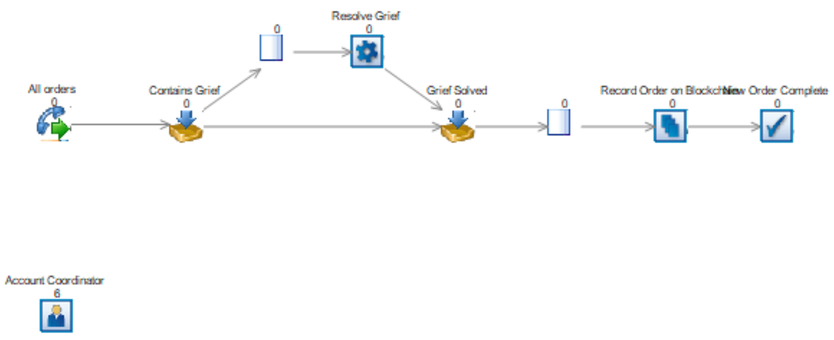
Blockchain Prototype Code

```
/**
 * Allow customer to add a part
 * @param {com.order.management.system.AddPart} addPart
 * @transaction
 */
async function addPart(tx) {
    const factory = getFactory();
    var part = factory.newResource(nameSpaceSystem, 'Part', tx.partNumber);
    part.partNumber = tx.partNumber;
    part.partDescription = tx.partDescription;

    // save the part
    const partAssetRegistry = await getAssetRegistry(part.getFullyQualifiedType());
    await partAssetRegistry.add(part);

    // emit the event
    var addPartEvent = factory.newEvent(nameSpaceSystem, 'AddPartEvent');
    addPartEvent.partNumber = part.partNumber;
    addPartEvent.partDescription = part.partDescription;
    emit(addPartEvent);
}
```

Simulation CURRENT State



Simulation with BLOCKCHAIN 'As It Could Be State'



FINDINGS

Benefits include:

- Reduce processing times by 60%
- Cost Reduction: approx. £130,000 pa
- Reducing conflicts and frustration
- Opportunity to improve customer response time from 6 weeks to 48 hrs
- Increased Customer Satisfaction
- Increasing's trust between customers and suppliers
- Live and dynamic updating and managing of orders in a single shared record

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DATA AND ANALYTICS

Uncertainty in Neural Networks: Applications in Manufacturing

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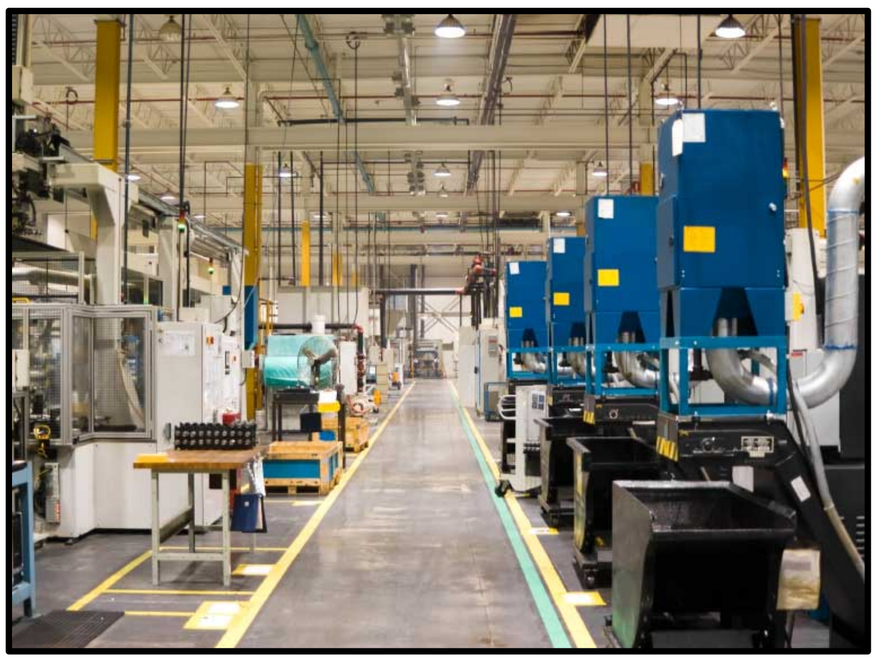
What are Neural Networks?

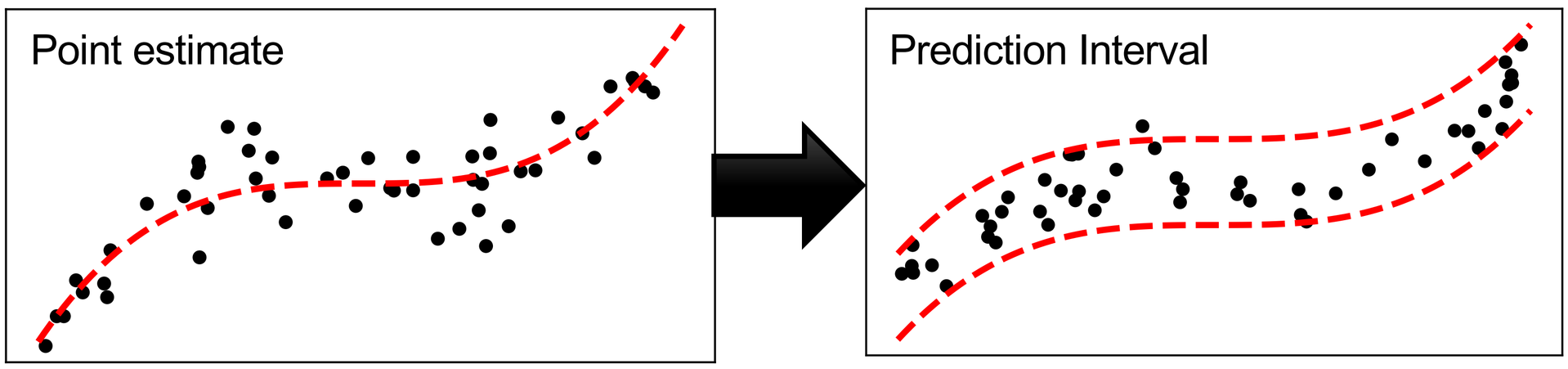
- Neural Networks (NNs) are simple mathematical models of neurons in our brain
- Provides a general mechanism for learning from data
- Forms the building blocks of today's AI applications
- e.g. Google translate moved from hand-crafted rules to a NN system



Why do NNs Need Uncertainty?

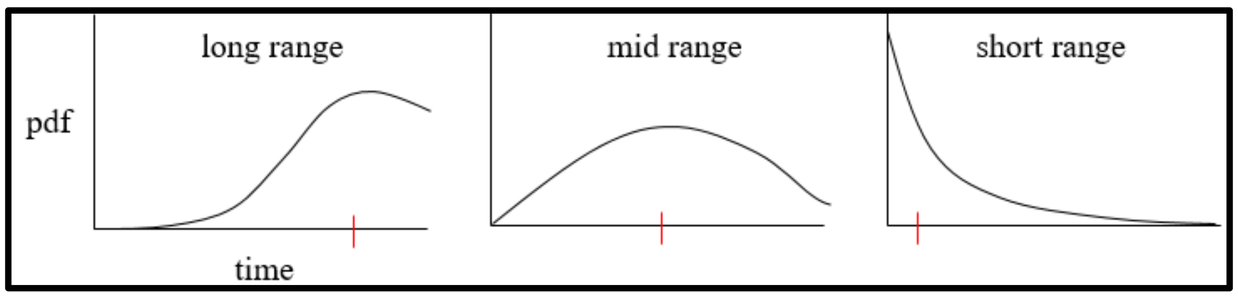
Imagine you're a factory manager. You are notified by an algorithm that a key machine of your process will fail in 60 days… How do you schedule maintenance on this information? Does it need repair tomorrow, or can it be run for 59 days?

Now, if the algorithm says that the machine will fail in between 45-65 days with 99% probability… timing of a repair is more easily scheduled.



How Can This Help Manufacturing Companies?

Example 1: Predictive maintenance

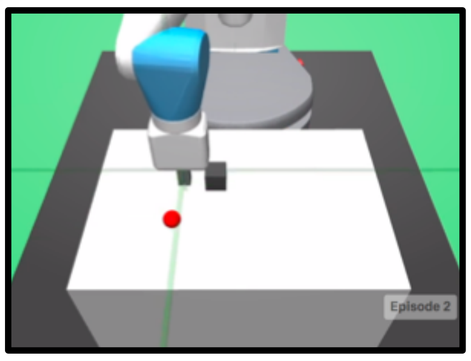


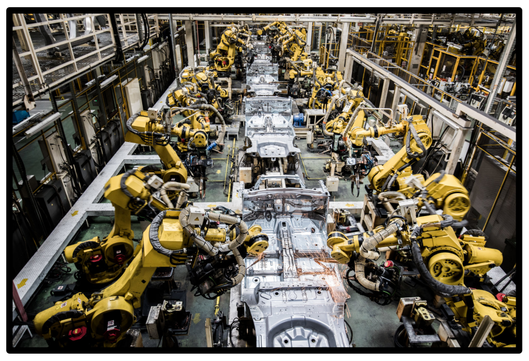
Claim No.	Product	Region	Comment	Part
123	Turbo range	UK	Customer complained about noise.	Fan-13A
124	Eco series	UK	Door sticking.	Hinge-112

Expected amount	Actual amount	Review?
$80 to $200	$123	NO
$20 to $120	$9,876	YES

Example 2: Automation of warranty claims assessment

Example 3: Improved learning for robotics





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Tim Pearce, Mohamed Zaki, Alexandra Brintrup, Andy Neely - High-Quality Prediction Intervals for Deep Learning: A Distribution-Free, Ensembled Approach – ICML 2018

Tim Pearce, Nicolas Anastassacos, Mohamed Zaki, Andy Neely - Bayesian Inference with Anchored Ensembles of Neural Networks, and Application to Exploration in Reinforcement Learning – ICML workshop 2018

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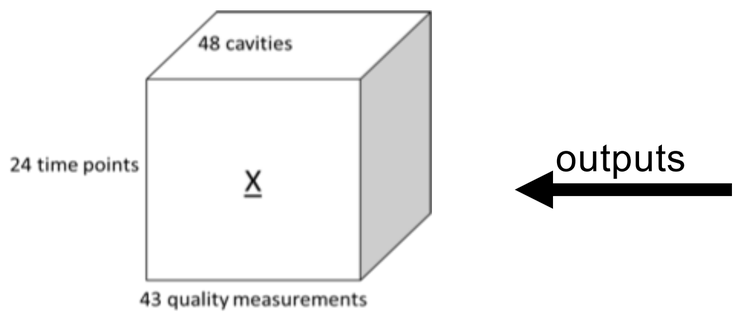
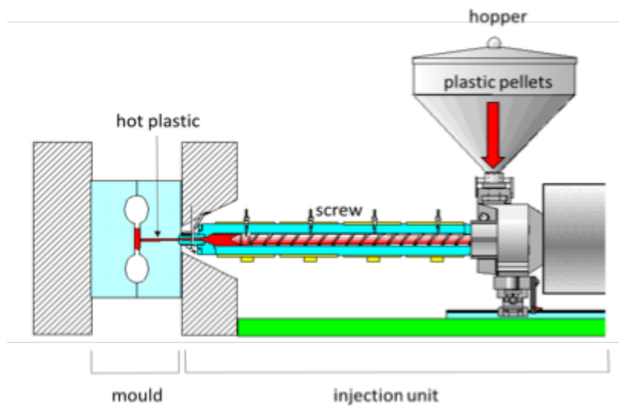
DATA AND ANALYTICS

Exploratory multi-way data analysis using PCA and PARAFAC applied to injection moulding processes

Introduction

The present poster uses the methods PCA (Principal Component Analysis) and PARAFAC (Parallel Factor Analysis) for studying the variability in quality outcomes coming from an injection moulding process.



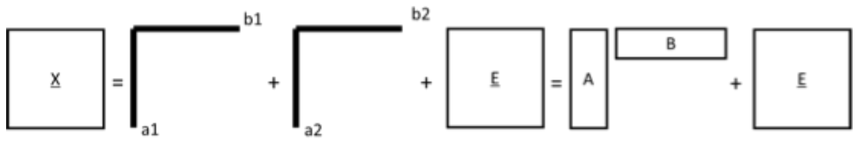


Addressed questions

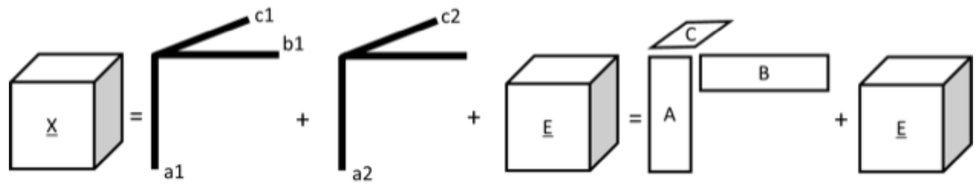
- ✓ Are the time points different from each other?
- ✓ Are all the quality measurements relevant?
- ✓ Is there consistency between mould cavities?

Methods

PCA – bilinear model



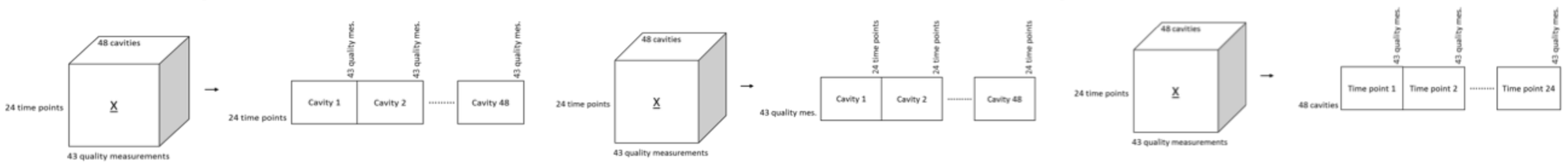
PARAFAC – trilinear model



Results

PCA – bilinear model

For answering the three questions with PCA, the data needs to be re-arranged in this manner:



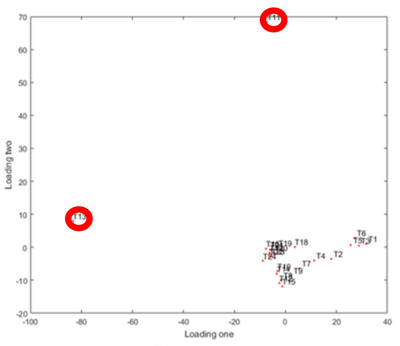
(a) (b) (c)

The obtained results are similar to the ones obtained with PARAFAC and are not going to be displayed.

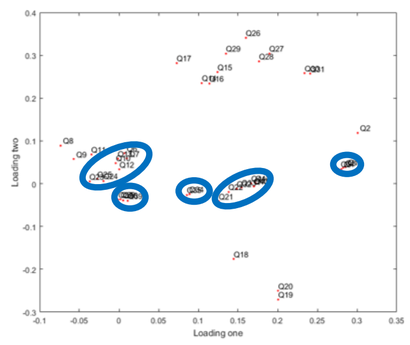
PARAFAC – trilinear model

3 components are selected based on the core consistency.

(a) Time points 11 and 13 are behaving differently.
The operator needs to check what changes happened at that time slot, e.g. material changes, humidity etc.



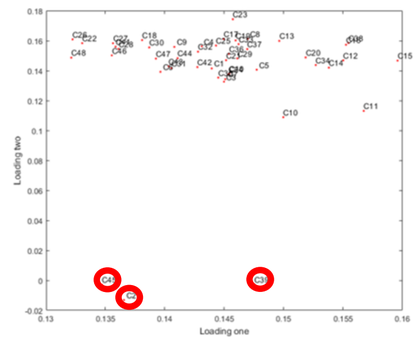
(a) Time points loadings



(b) Quality measures loadings

(b) Some groupings are obtained in the quality measures, meaning that some of the measures can be dropped since they are close to each other.

(c) Cavities 2, 39 and 45 behave differently.
The operator should check why these are different, e.g. check visually the mould, or do other kind of inspections.



(c) Cavities loadings

Conclusions

In general same conclusions as given by PCA are obtained. However, PARAFAC is much faster and easier to implement. Usually, replicates appear closer in the scores plot due to a stronger structural modelling in PARAFAC. Some groupings of quality measures can be observed, i.e. in the future these can be dropped.

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Digital Transformation

Developing a Process for Formulating a Digital Transformation Strategy

Background:

Digital transformation, which can be defined as the use of technology to radically improve the performance or reach of companies is becoming the focus of many firms across the globe. Companies in all industries are becoming more reliant on the use of digital technologies. Technologies such as analytics, mobility, social media, smart embedded devices and many more are changing the way companies interact with their customers, manage internal processes, deliver value propositions and ultimately explore new business models.

Problem:

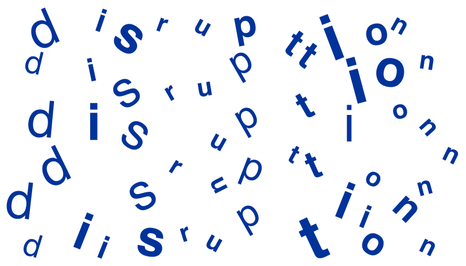
A Missing Process for Strategy Formulation

Digital technologies have become a disruptive force, which can change the landscape of an industry very rapidly and cause companies to lose their competitive positioning. Given this challenge, managers are left with the question of how to successfully lead their companies through digital transformation.

A clear strategy process is needed.

Digital Technologies

The Effect: **disruption**



The Imperative: **transformation**

The Need: **strategy formulation process**

Research Question:

How can companies formulate a digital transformation strategy?

Research Contribution to Industry:

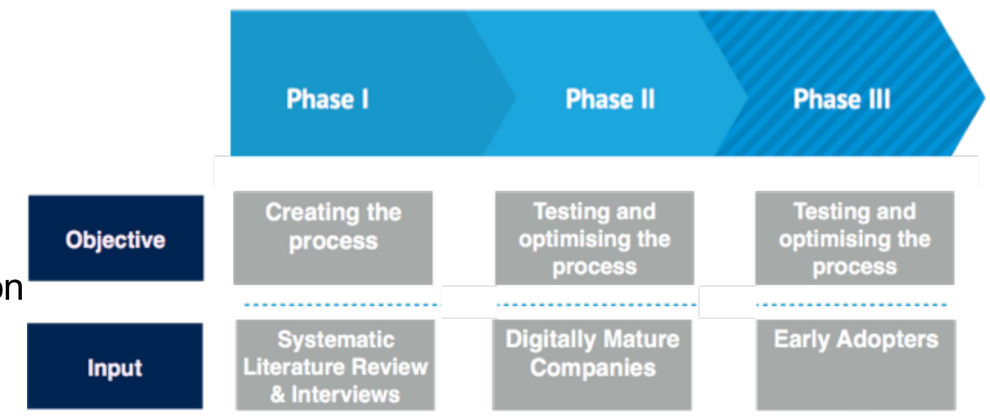
-Delivering ***a validated and tested strategy formulation process:***

- ***Developing*** the strategy formulation process ***with digitally mature companies***
- ***Testing*** the strategy formulation process ***with early adopters***

-Identifying the ***context*** and ***content*** of digital transformation

-Demonstrating the ***interactions*** between ***digital resources***, ***digital capabilities*** and other ***organizational capabilities*** for a sustainable competitive advantage

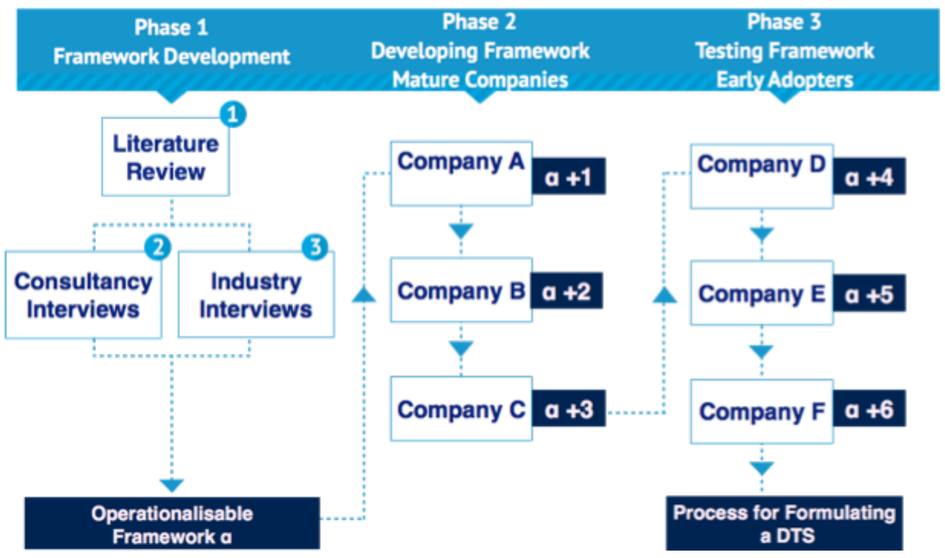
-Delivering a ***digital transformation blueprint*** as an outcome that can then be translated into an action plan



Research Approach:

Process Research

A methodology developed to defy the shortcomings of current strategy research. It is of particular relevance for this research, as it aims at developing processes to operationalise frameworks and provide managers with practical approaches.



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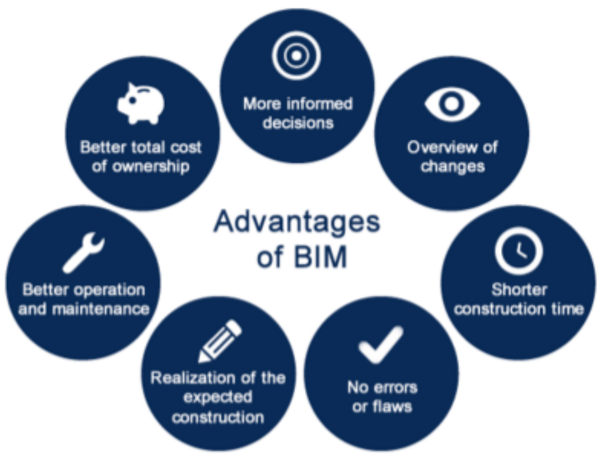
DIGITAL TRANSFORMATION

A Multilevel Framework of the Practices Influencing the Performance of Digitally Enabled Construction Projects

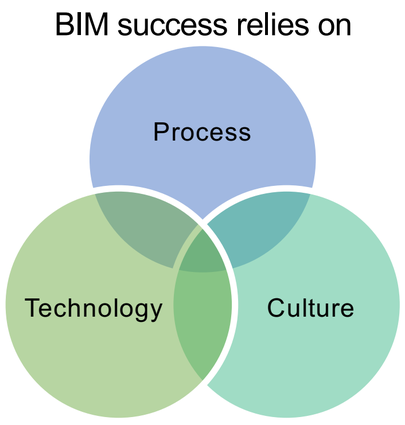
Introduction

Building Information Modelling (BIM) sits at the heart of digital transformation across the UK built environment



The Problem

BIM full potential cannot be realised without corresponding changes in both organisational and inter-organisational practices and processes



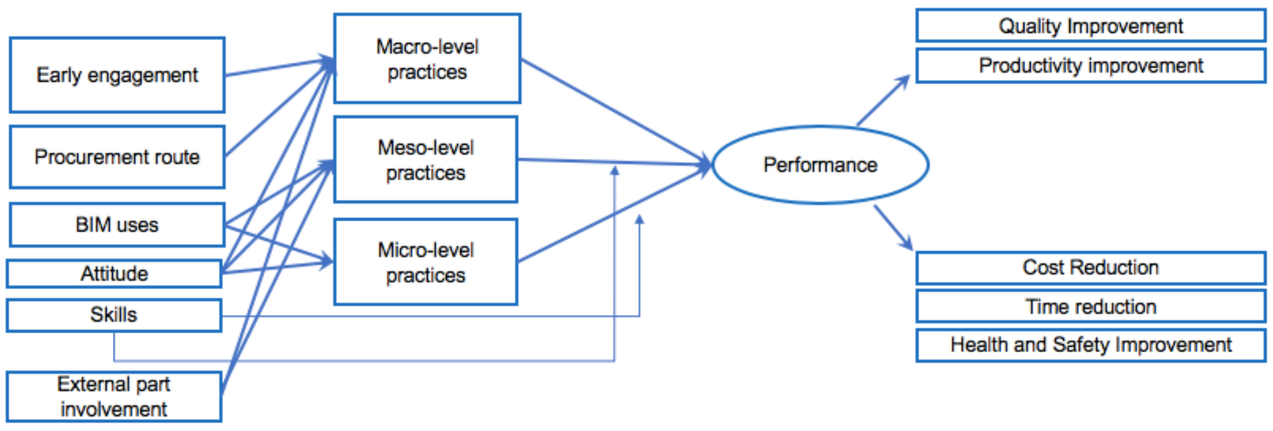
Need to understand the changes in processes and practices necessary to implement BIM and achieve improved outcomes

Research Opportunity

There are contradictions in the literature regarding the changes in processes and practices that impact BIM projects performance

Research Objective: Elucidate which practices and mechanisms influence the successful execution and completion of digitally enabled construction projects

Preliminary Framework



Exploratory Study

- Secondary data analysis of 52 BIM projects from BIM+ database
- Ongoing case studies - University Projects

Expected Contributions

BIM projects literature
- Shed light on existing contradictions
- Investigate the role of unexplored factors and practices at different levels

Practical application
- Provision of guidelines for project managers
- Assist in recognising project issues that require improvement

Inter-organisational relations literature
- Contribution to the calls for more context-driven research

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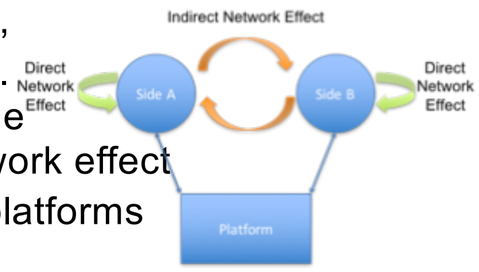
DIGITAL TRANSFORMATION

Digital Platform Ecosystem Orchestration in a traditional Industry

Background

- Digital platforms transformed our way of life: shopping, travelling, socializing etc.
- Platforms tend to become monopolistic due to network effect
- Only limited number of platforms succeed.

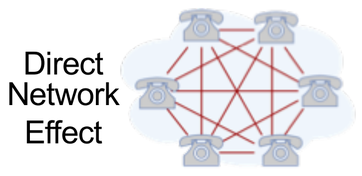


Our research aims to answer these questions:

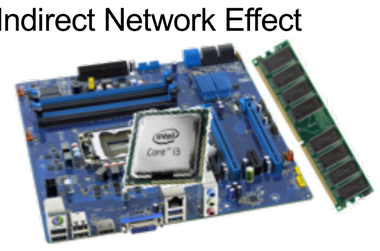
- **How do platforms orchestrate their ecosystem in a Traditional Industry?**
  - What should f platforms do to reach critical mass?
- **Why do some platforms outperform others?**
  - What strategies have been adopted by the more successful platforms

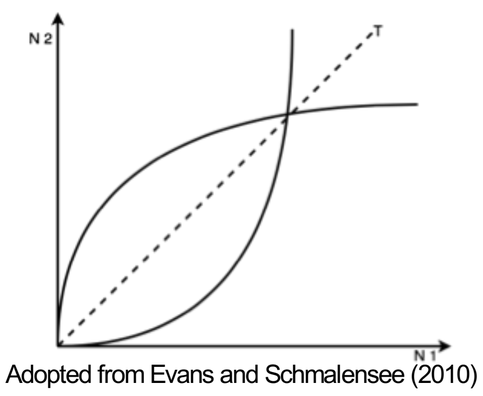
Critical Mass

- Network value increases with the number of users
- Critical Mass hypothesizes the equilibriums of network user numbers
- A chicken and egg problem for networks with indirect network effects



Indirect Network Effect





Adopted from Evans and Schmalensee (2010)

Case Study: Chinese Used Car Platforms 2008-2018

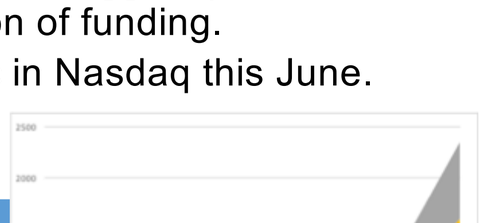
- Largest new car market in the world
- Potential for explosive used car market growth

Country	New Car Vol.	Used Car Vol.
China	28.1 mil.	12 mil.
US	17.1 mil.	42.7 mil
UK	2.5 mil.	8.1 mil

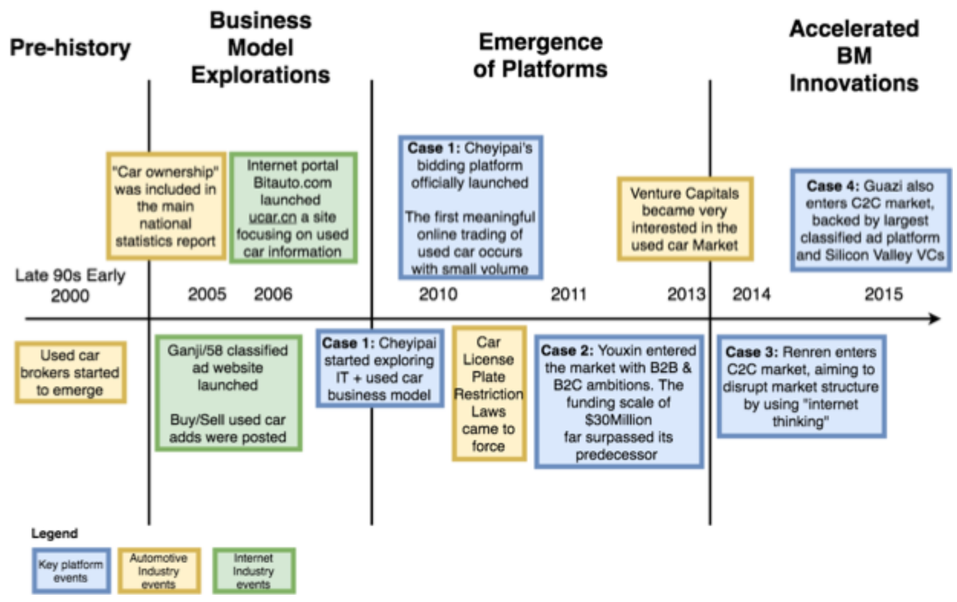
Four major platforms in the market

- Our case study covers the 4 biggest platforms.
- They raised over $4 billion of funding.
- One platform went public in Nasdaq this June.

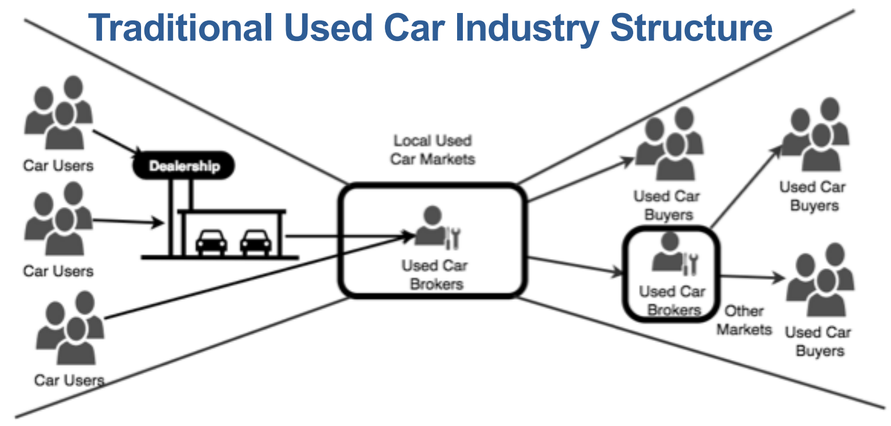
Year / Cases	2011	2012	2013	2014	2015	2016	2017
1. CYP	5		20	50	100		
2. Youxin			30	260	170		500
3. Renren				25	85	150	200
4. Guazi						250	400



Brief History of Chinese Used Car Platforms

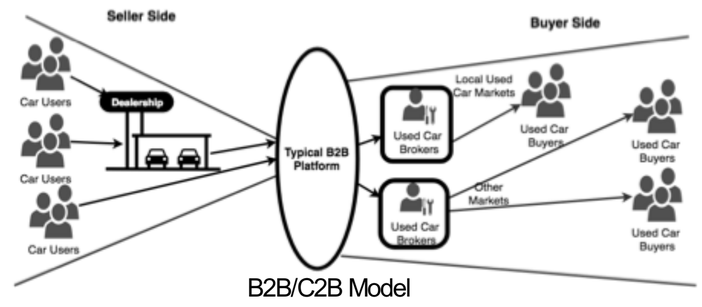


Traditional Used Car Industry Structure

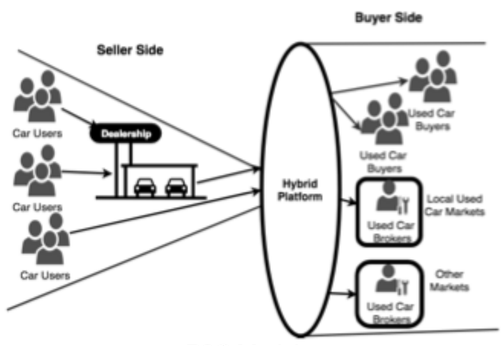


Digital Platform Disruptions

- B2B/C2B business model initiates first platform
- B2C BM establishes market potential for VCs
- C2C BM further disrupts existing structure



B2B/C2B Model

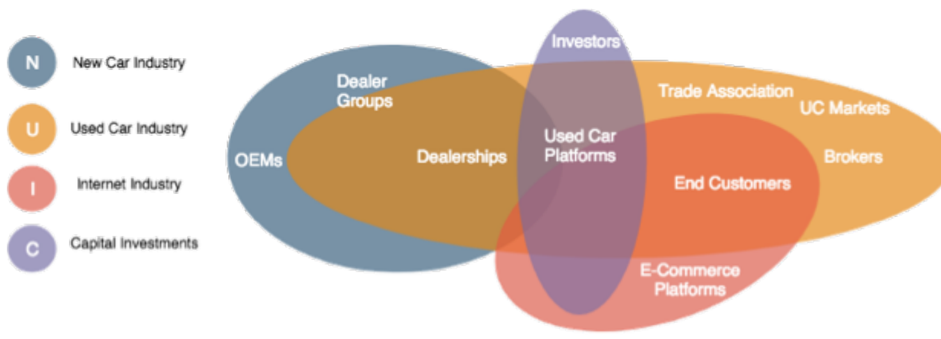


B2C Model

C2C Model

Leverage Appropriate Institutional Fields at Appropriate time

- Early critical mass was reached by leveraging Industry experts.
- Platforms succeeded in expansion stage by winning key suppliers.
- Later stage competes on funding capabilities.



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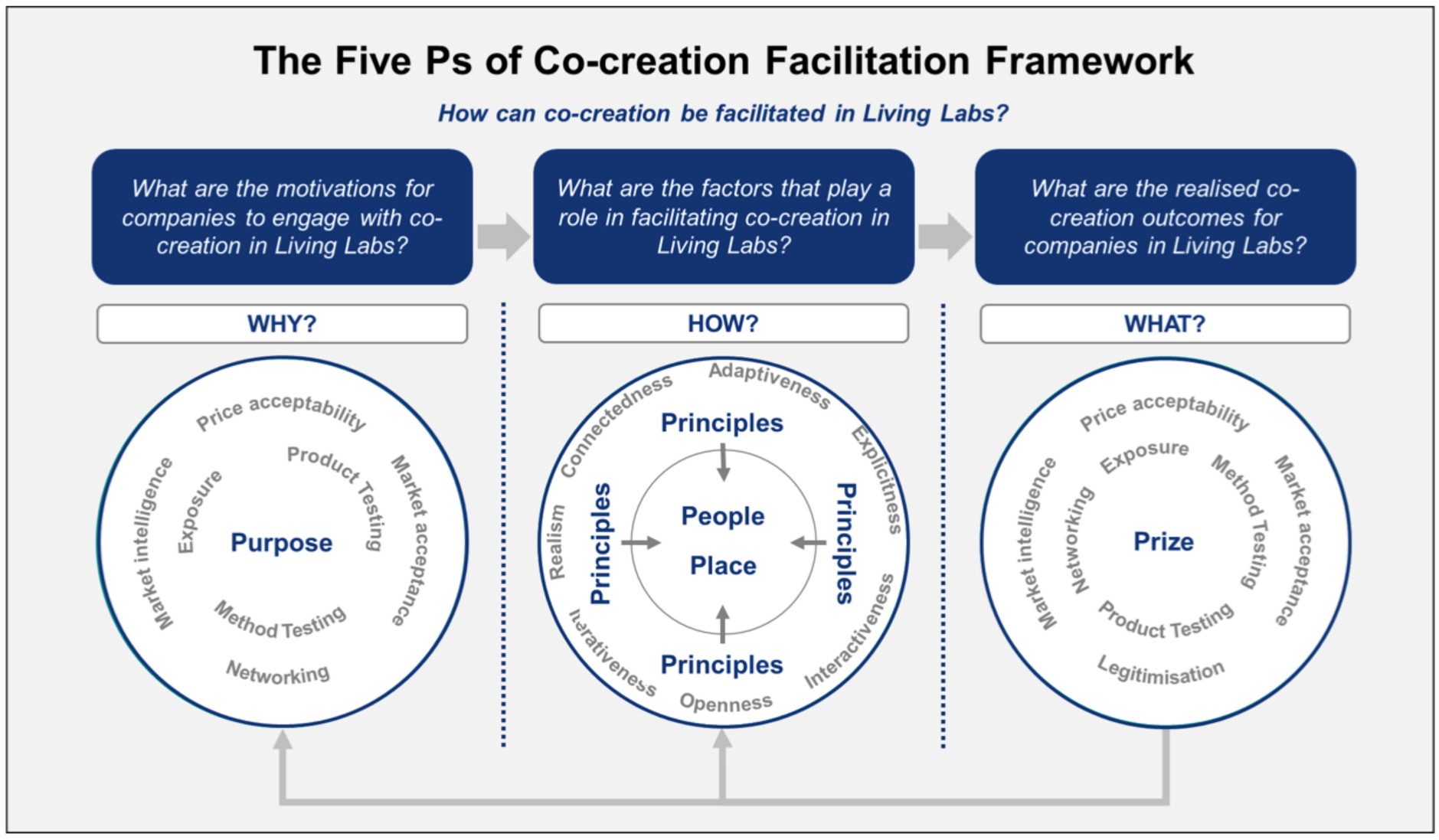
BUSINESS MODELS

Facilitating Co-creation in Living Labs

Open innovation is practiced in about 80% of businesses*1

Traditional closed innovation models are rapidly being replaced by more open approaches, where businesses collaborate with a variety of stakeholders to co-create unique value. Living labs (LLs) are gaining popularity, as they offer companies a new way to innovate in real-life contexts. While co-creation in LLs offers numerous benefits, it also raises challenges. Coordinating co-creation in LLs is particularly complex, as it requires the inclusion of more activities and stakeholders than those of closed innovation models. For this reason, it is critical to identify how co-creation can be facilitated in LLs.



WHY

1 Purpose

- Guide firms and living lab facilitators on how to utilise LLs.
- Understand companies' motivational drivers for participating in a co-creation process.
- Tailor the facilitation service to the needs of the company.

HOW

2 Principles

- Principles provide the foundation that defines the place and guides the behaviour of people that interact in a LL.

3 People

- People integrate the co-creation principles that are associated with the activities and behaviour of stakeholders that are involved in the co-creation process.

4 Place

- Place describes the location of the living lab, its physical layout, the complementary facilities and the methods and data collection tools that are employed.

WHAT

5 Prize

- Evaluate the impact of co-creation projects and determine which approaches worked best.
- Present planned and unplanned project outcomes separately to identify what outcomes companies expected to accomplish and what was unexpectedly achieved.
- Achieve continuous learning for the living lab, and serve as a feedback process for their own operation as a service provider.

More information available at:

www.katharinagreve.com

*1 Brunswicker and Chesbrough (2018)

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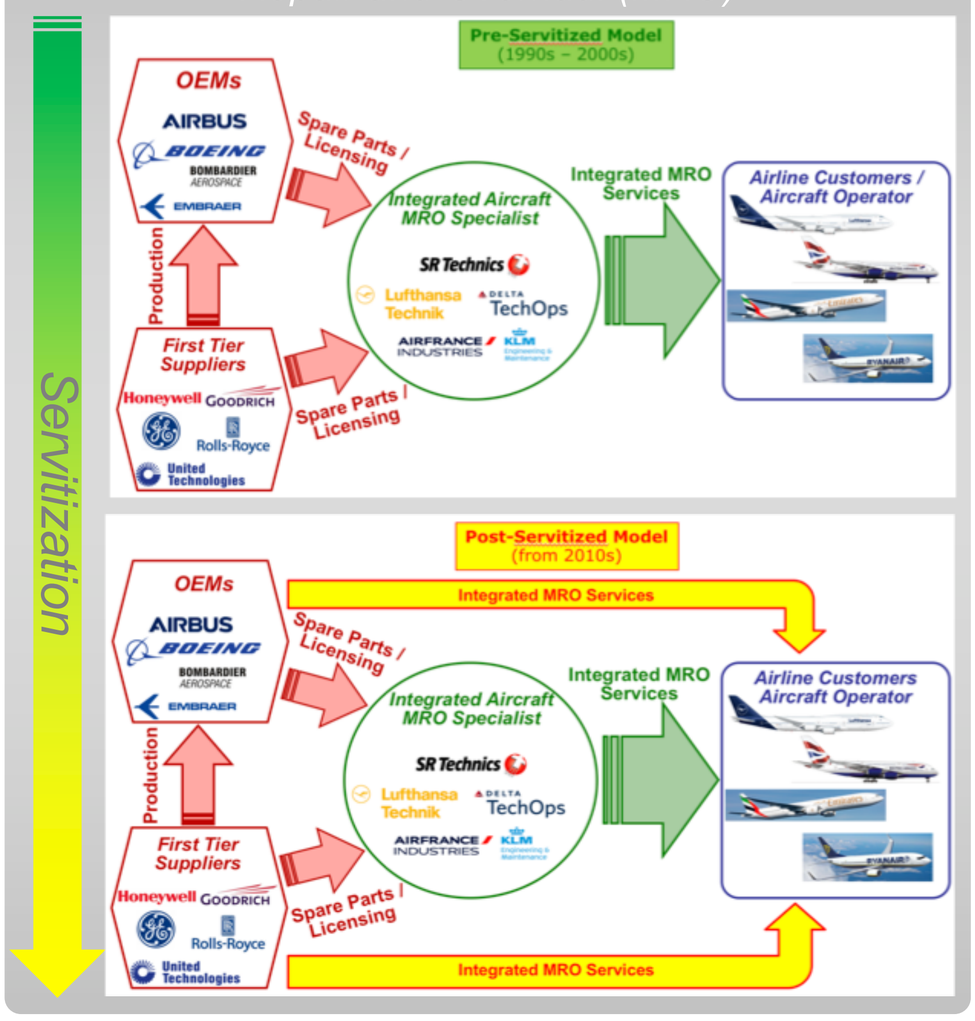
Innovation and IP Management

Value Capture of Service Business Models

Research Topic

Servitizing OEMs enter into competition with new and unusual rivals [1], thereby creating **new competitive dynamics in a business ecosystem**.

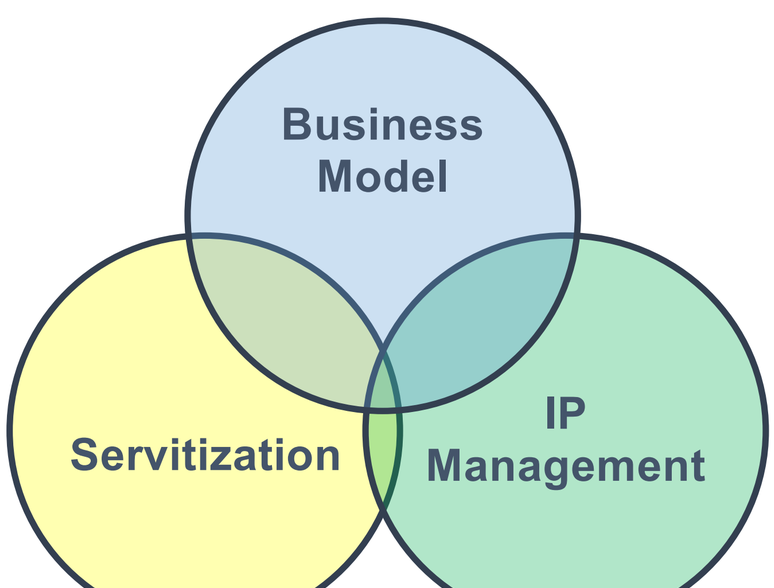
The Case of Commercial Aircraft Maintenance, Repair and Overhaul (MRO)



Research Problem

Analogously to technology-driven product innovations, **business models also require protection** [2], particularly in the services industry sector. But the latter **has been omitted by intellectual property (IP) management research** until recently [3].

Literature



Research Questions

RQ1. How do **servitizing OEMs affect the competitive positioning** of incumbent service providers (ISPs) in a **service-industry ecosystem**?

RQ2. How do service providers use **formal and informal IP strategies** for defending their competitive position?

RQ3. How can servitizing OEMs and ISPs use formal and informal IP strategies to **defend and adapt their competitive position** from the challenge posed by new competitive dynamics?

Methodology

Phase 1	Phase 2	Phase 3
Literature Review	Literature Search for IP Strategies	Action Research/ Workshops at Servitizing OEMs/ISPs
Exploratory Interviews in Services Ecosystems	Survey of IP Specialists in Service Firms	Cross-case Synthesis

Q3 2017 — Q2 2019 — Q1 2021 — Q3 2022

Project Outcome

A framework that maps IP strategies to product-/ technology-based service business models.

			Service Business Model					
			SBM1	SBM2	SBM3	SBM4	SBM5	[…]
IP Strategies	Formal	Patents						
		Trade-mark						
		[…]						
	Informal	Trade Secret						
		Lead Time						
		[…]						

Conference paper
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References

[1] Vandermerwe, S. and Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), pp. 314-324.

[2] Bonakdar, A., Frankenberger, K., Bader, M. and Gassmann, O. (2017). Capturing Value from business models: the role of formal and informal protection strategies. *International Journal of Technology Management*, 73(4), pp. 151-175.

[3] Bader, M. (2007). Extending legal protection strategies to the service innovations area: Review and analysis. *World Patent Information*, 29(2), pp. 122-135.

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