



The Implementation of Industry 4.0 to improve Sustainability Performance in the Dutch Construction Industry

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Background

The Dutch Construction Industry is currently facing challenges over its massive waste produced in their manufacturing process. The Dutch Climate Agreement also fosters the industry to serve the increasing demand for sustainable building material to achieve the energy transition. The Dutch construction industry, thereby, seeking alternative means to address such sustainability challenges. By learning from other industry, implementing Industry 4.0 can be an opportunity for them to grow sustainably.

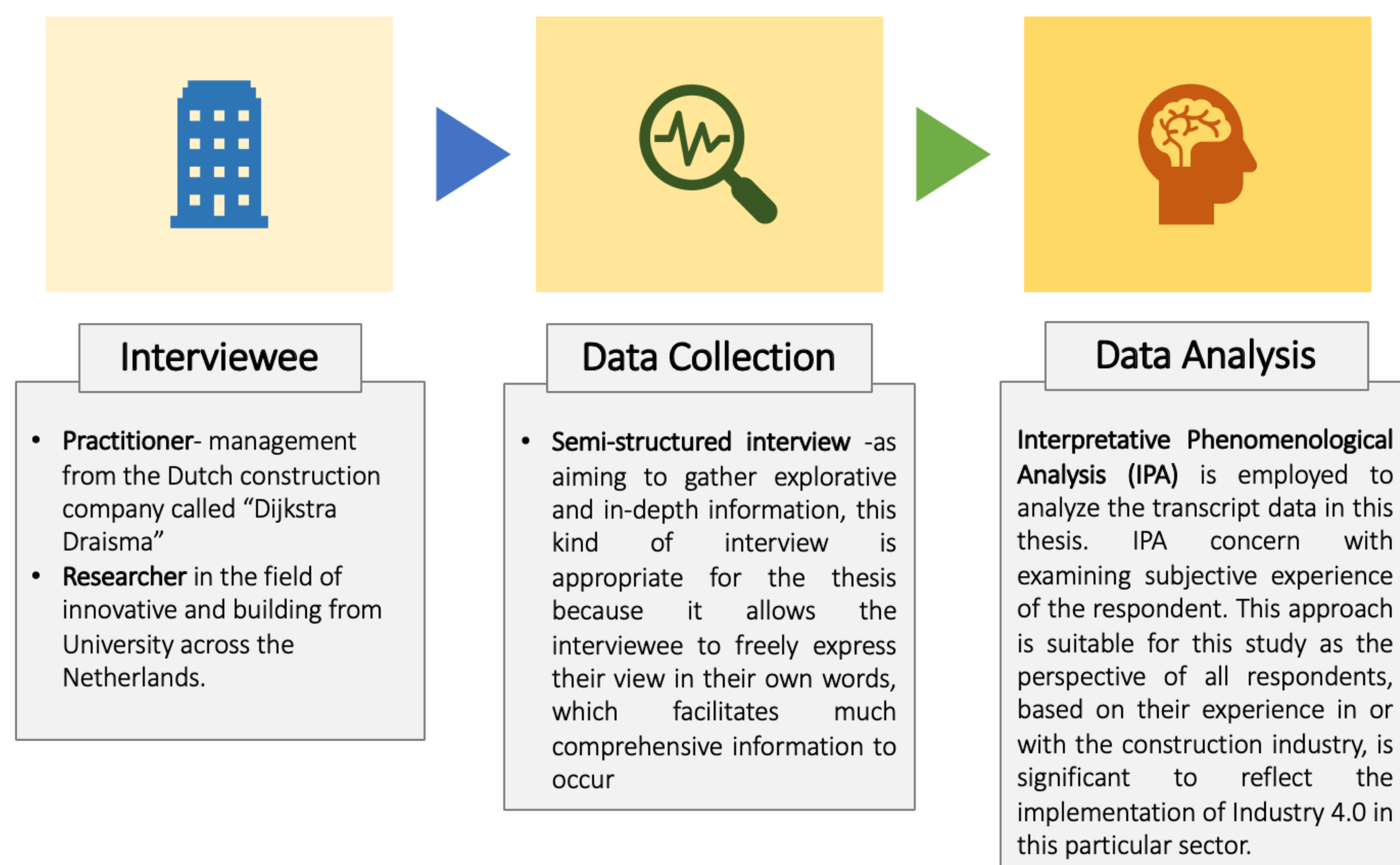
Objective

This thesis aims to conduct an explorative study on the implementation of Industry 4.0 in the Dutch construction industry to improve sustainability performance. By applying the Sociotechnical System theory, this research propose the Dutch construction industry to make a holistic change across business functions to ensure the balance between humans, characteristics of an organization, and new technology to pursue sustainable opportunity given by Industry 4.0.

Introduction

As push by the Dutch Climate Agreement, the Dutch construction industry need to address the growing demand of sustainable building materials and to cope with its massive amount of waste produced in manufacturing process. According to the literatures, Industry 4.0 can enhance organization sustainable performance e.g. reduce cost and time in production , enhance energy consumption efficiency, reduce waste, and improve employee skill. Unlike automotive and manufacturing industry, the construction industry is facing a challenge over its lowest capital for investment, lacking of knowledge in manufacturing technology, unadapt culture and fragmented value chain. Regarding these obstacles, a suitable strategy for the construction industry to implement Industry 4.0 to pursue sustainable outcome is still in the puzzle. This thesis, thereby, conducted to answer the research question of how can the Dutch construction industry implement Industry 4.0 to drive sustainability performance?

Methods



Results

Bridging the knowledge gap in Industry 4.0.

- Initiating On the Job Training to upskilled the employee to work with new technology and innovative environment.
- Establishing the knowledge-based community to create collaboration between practitioner and academic to enhance insightful on the subject of Industry 4.0

Transforming the traditional culture

- Fostering open, adaptable and agile culture.
- Emphasizing on the change management strategy to ensure smoothest transition to new culture and to prevent people resistance to change

Integrating the value chain

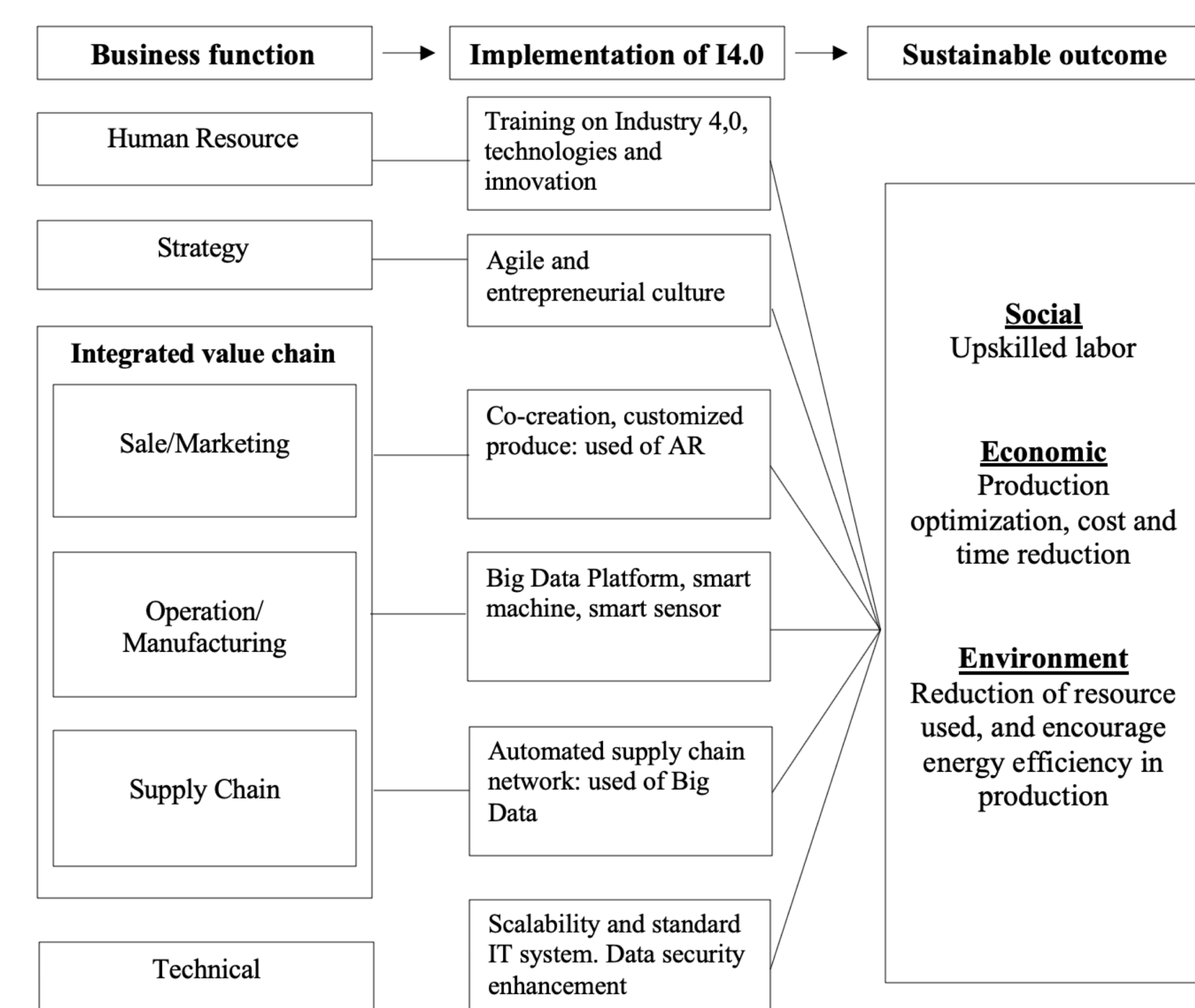
- Developing Big Data to pursue economic and environmental benefit; cost and time efficiency, material passport tracking for recycling and reuse of material.
- Applying Augmented Reality to enhance sale and encourage co-creation with customer.
- Enhancing automation concept in supply chain to reduce cost and time in re-do work.

Developing IT infrastructure

- Developing scalable IT infrastructure and to ensure data security.

Conclusions

- The results reveal several insights regarding the implementation of Industry 4.0 in the Dutch construction industry to improve sustainability performance. The result of this study demonstrates that Industry 4.0 is an opportunity for the Dutch construction sector to grow sustainably
- The finding address the significant interplay between human resource, culture and technology. Hence, the holistic change across business functions is required, which is complementing the recommendations advised by the Sociotechnical System Theory.
- The Dutch Construction Industry need to transform its HR, Strategy, Operation, Sale and Marketing, Supply Chain, and IT function to serve the transformation of Industry 4.0



Industry 4.0 Implementation Framework for Dutch Construction Industry