Emerging Mobility in Smart Cities Empowered by Blockchain and Deep Data

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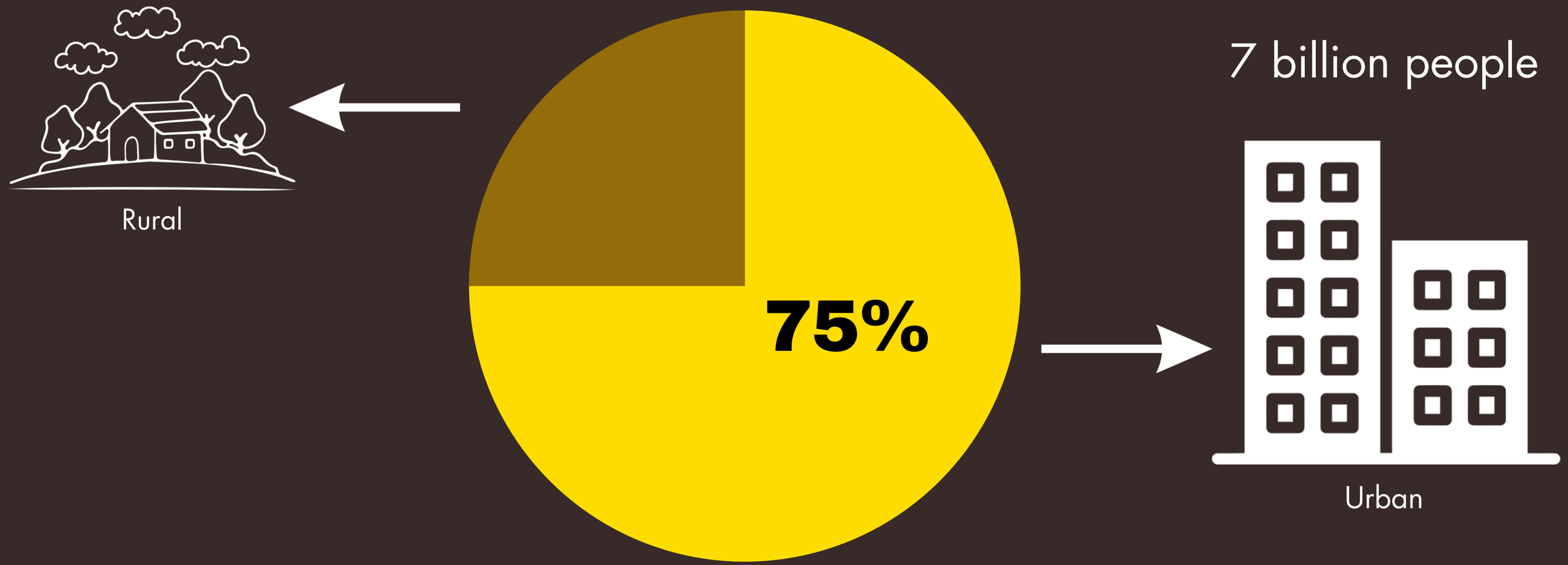
2025 World Population

Environmental sustainability, quality of life, transport, power, water usage etc.



1. Mobility-as-a-Service (M-a-a-S)

Smart City 

- information and communication technologies (ICTs)
- reduced cost and resource consumption

Sharing Economy 

- blur the line between ownership and access by using and distributing underutilised assets

M-a-a-S 

- a potential smart mobility solution
- multiple modes of transport, one single application, user-oriented approach, mobility packages, real-time information, multimodal journey planner

MaaS presents an alternative to private vehicle ownership and has the potential to revolutionize urban mobility (Butler et al., 2021).

2. Blockchain

Advantages

- Chained back data
- Transparency of transmitted data & Distributed nature

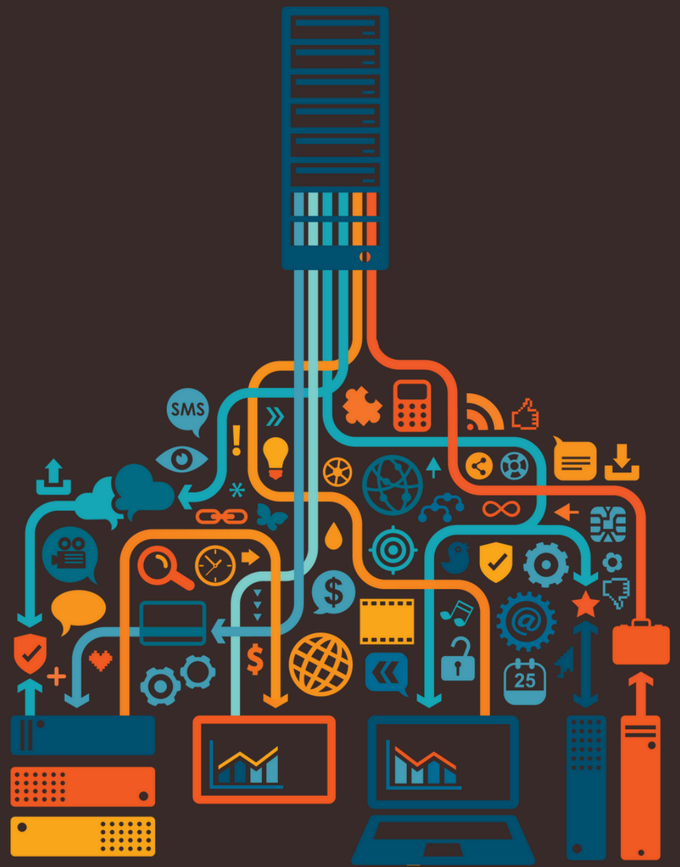
Suitable in MaaS

- Capability to track the ownership of data
- Eliminates the need for a middleman

Further Applications

- Ownership to be traded
- Personalised service
- Optimum congestion management
- Ride-sharing, parking sharing, energy trading

3. Deep Data



Analyse large amounts of data

- Collect data from sensors, vehicles, and other sources
- Improve: predictions, decision-making
- Areas: traffic management, route optimisation, and vehicle performance

Combine with Blockchain

- Analyses and optimises mobility operation
- Ensures the privacy and security of sensitive data
- improved traffic flow, reduced congestion, and enhanced user experiences

4. Ethics

Although...

Blockchain & Deep Data -

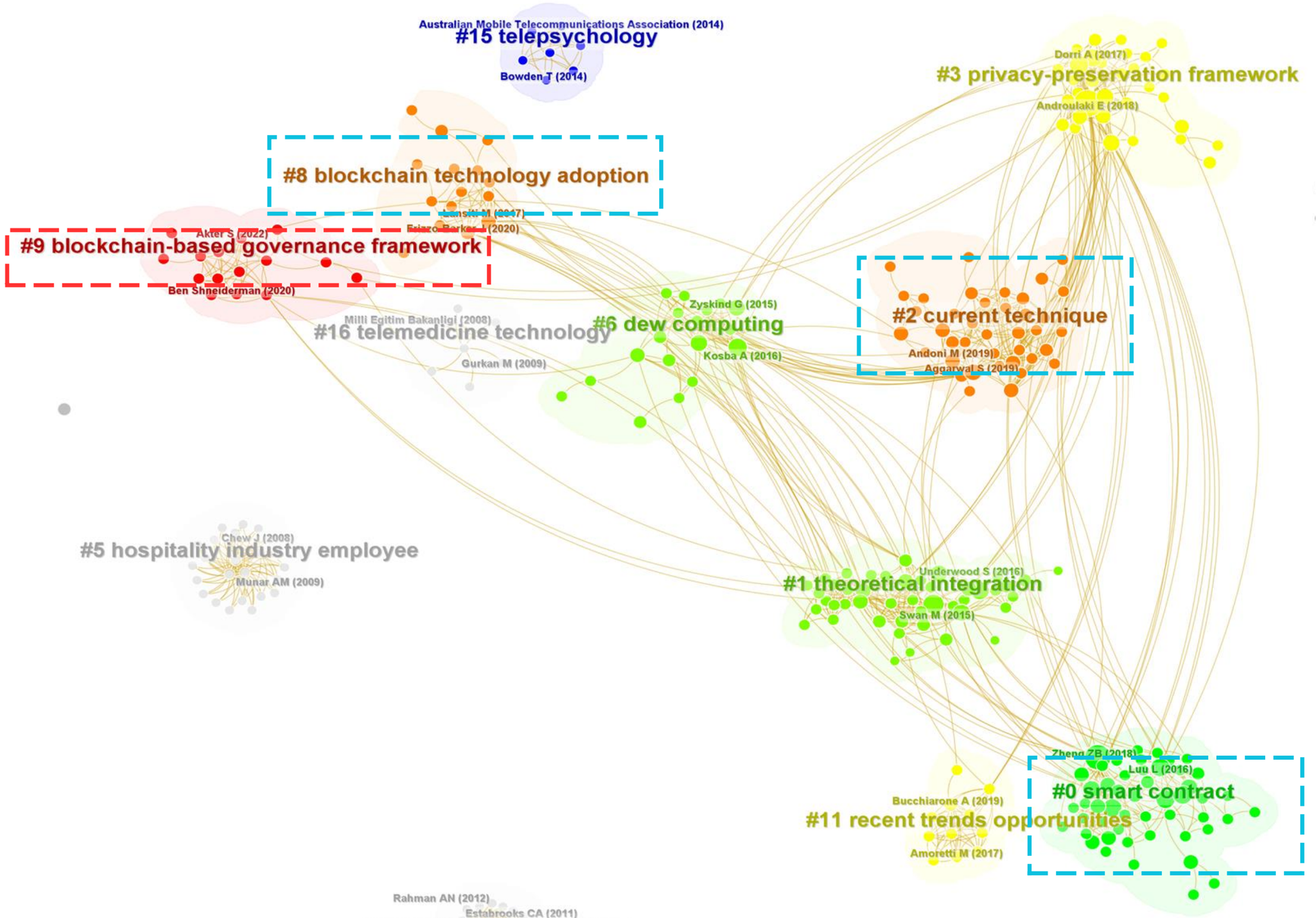
Benefits & Opportunities

However...

Ethics -

- Systematic studies fragmented
- Blockchain community member - defines the moral values
- A structured framework of ethics
- Guide future research and practices

6. Bibliometirc - Blockchain & MaaS & Ethics



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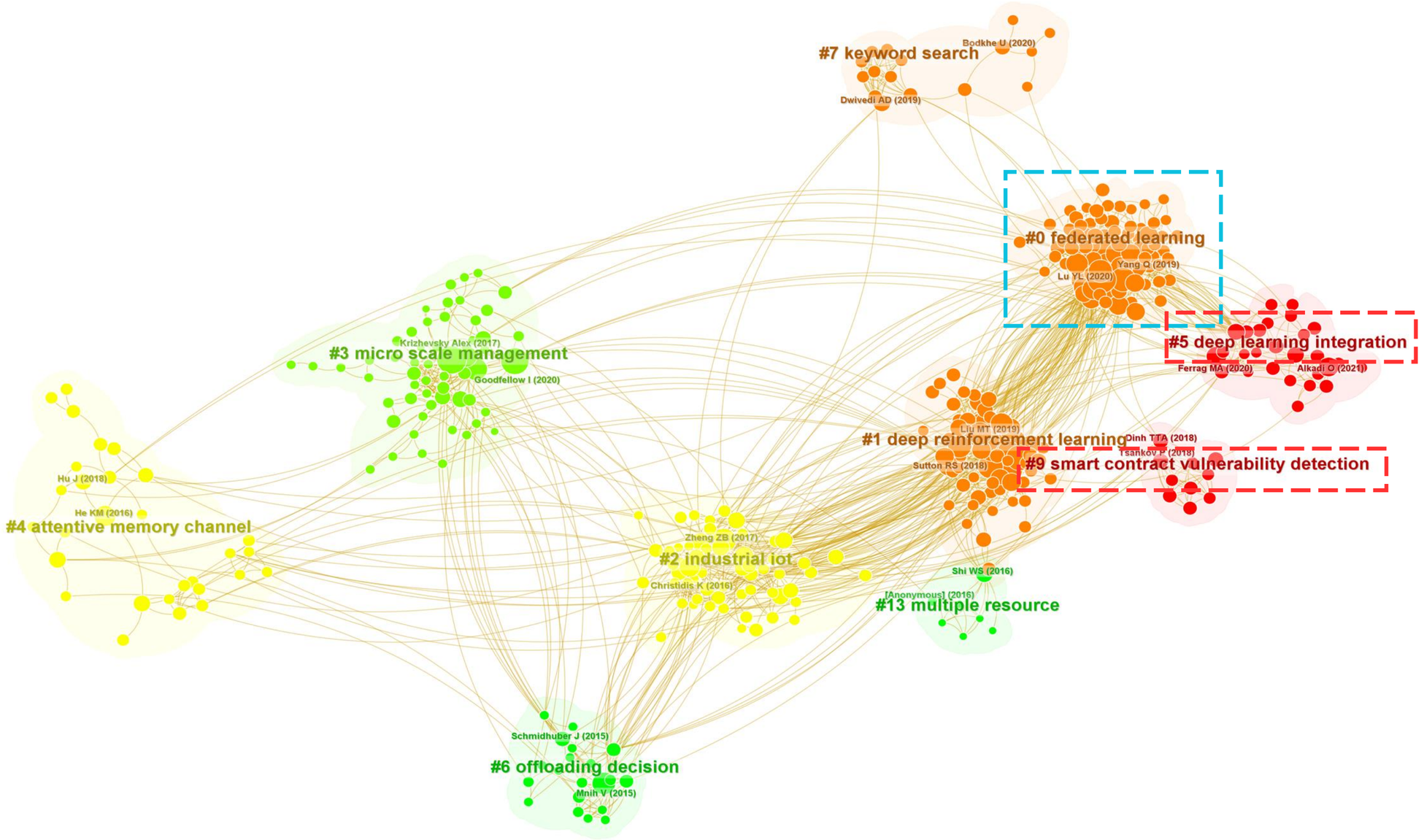


RQ1: How can blockchain and deep data enable personalised mobility services while safeguarding user privacy?

RQ2: What effect could blockchain-driven personalised mobility services have on urban congestion and transport efficiency?

RQ3: What ethical challenges arise from blockchain adoption in smart urban mobility, particularly around data privacy and ownership?

1. Evaluating the Feasibility of Blockchain in the Australian P2P Car-sharing Industry

SWOT Analysis

P

Political
- Australian government's assistance

E

Economic
- Economic growth potential
- Uncertainties of value return
- Growth in global investment
- Growth in the peer-to-peer economy

S

Social
- Growth of citizens' sustainability awareness
- Trust
- Individualism

T

Technological
- Advancements in Blockchain technology
- Growth of Blockchain-skilled professionals
- Perfection of the Blockchain system
- Improving digital infrastructure

E

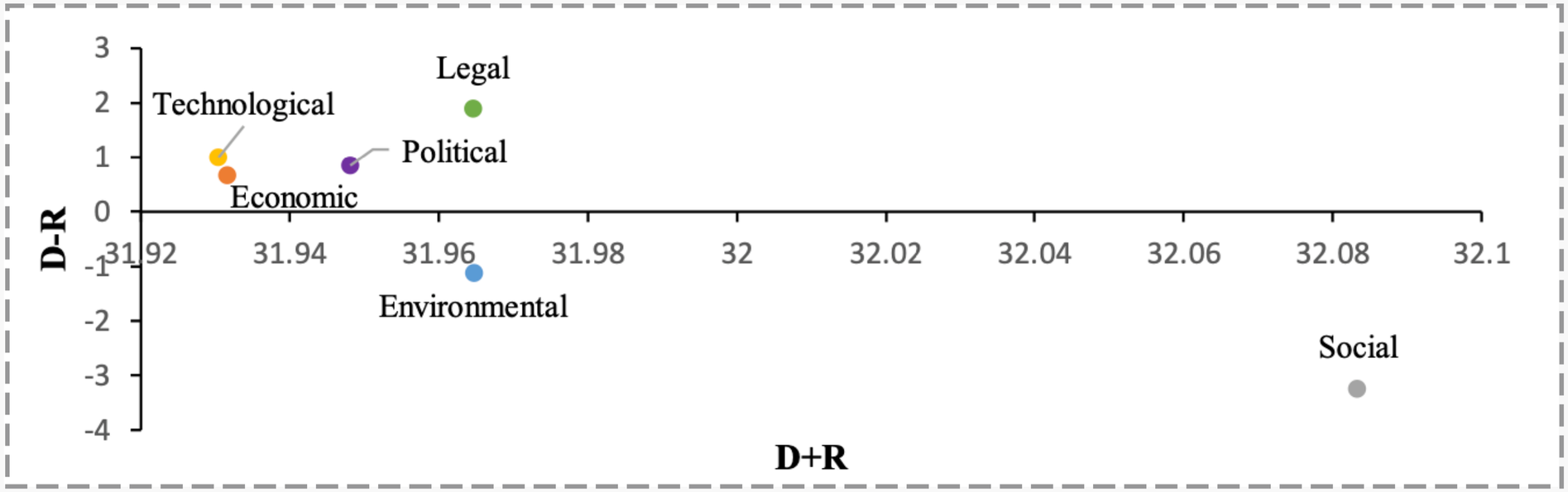
Environmental
- Increase of resource efficiency
- Green computing movement

L

Legal
- Government Policy
- Privacy
- Regulatory Barriers

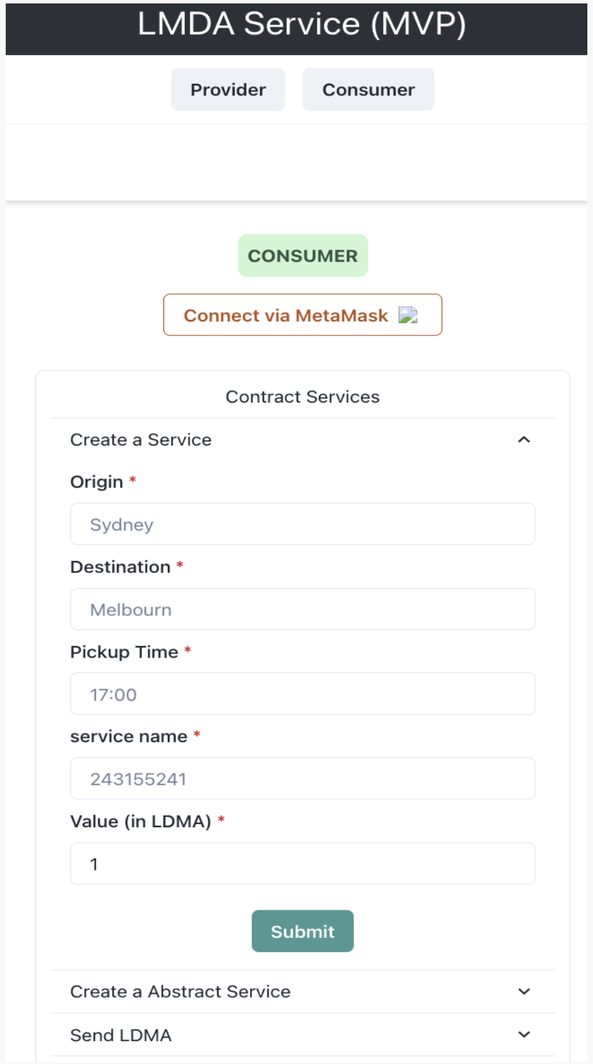
PESTEL Analysis

1. Evaluating the Feasibility of Blockchain in the Australian P2P Car-sharing Industry

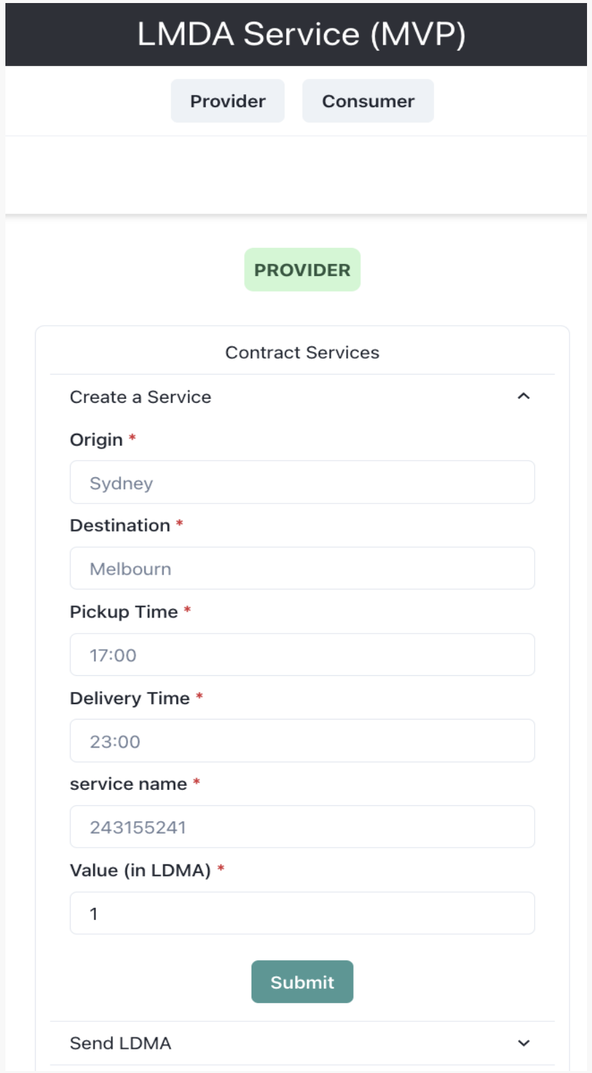


Cause and Effect Diagram by DEMATEL Method

2. Last-Mile Delivery Application (LDMA) Project

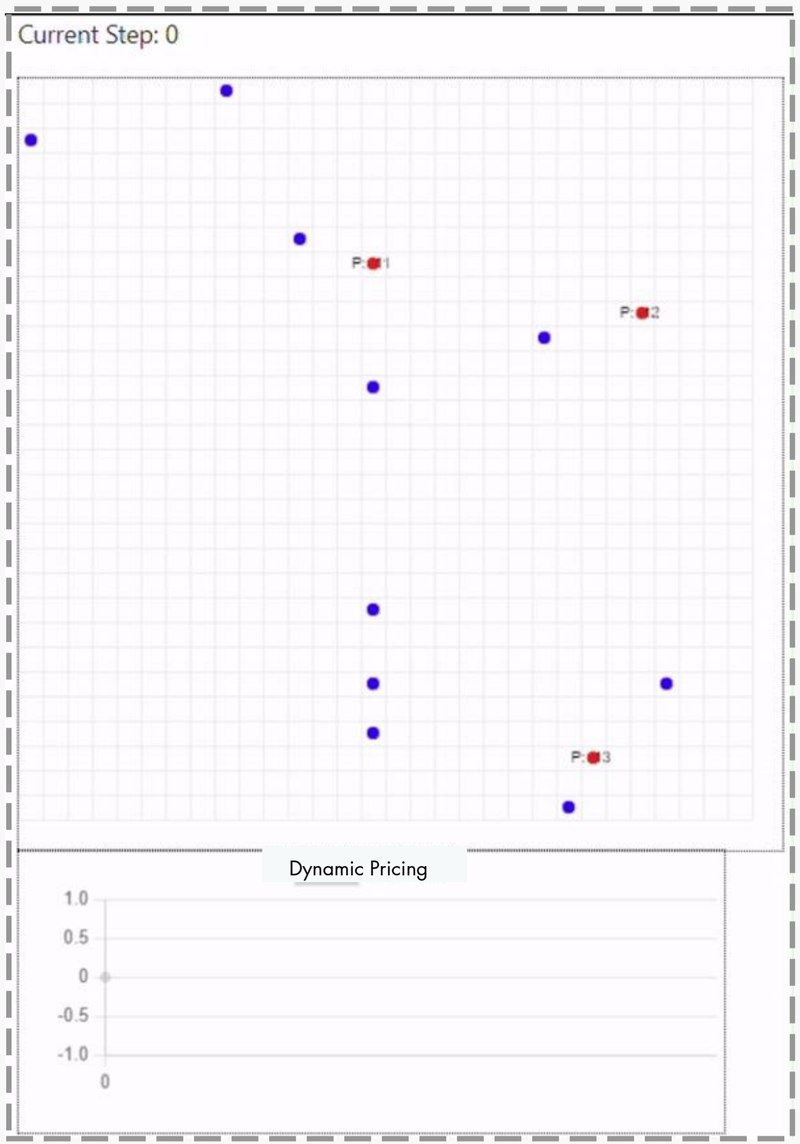


Consumer Interface

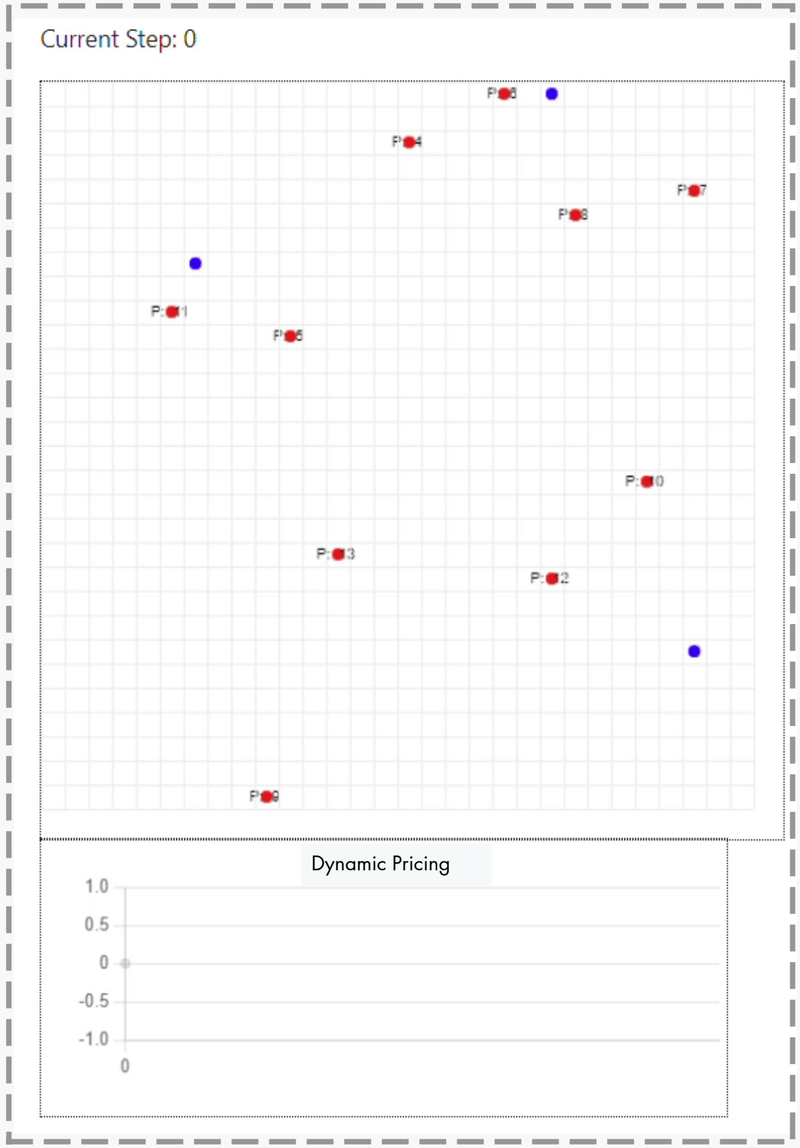


Provider Interface

2. Last-Mile Delivery Application (LDMA) Project - Simulation



Consumer: 10 Provider: 3



Consumer: 3 Provider: 10

Consumer Agent
Provider Agent
Delivering

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Q&A