Identifying Business Models of Open Data Intermediaries: A Review

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Introduction

- Potential benefits of open data
  - stimulating innovation, enhancing accountability and transparency, improving the reproducibility and dissemination of research … (Janssen et al., 2012; Uhlir & Schröder, 2007; Zhu et al., 2019)

- Various shortcomings in the current open data initiatives
  - mismatch between the supply and demand of data, the lack of appropriate software to process data, confusion regarding data licenses … (Johnson et al., 2017; van Loenen et al., 2021)

- The role of open data intermediaries is considered important
  - facilitate the use of and access to open data (Chattapadhyay, 2014; González-Zapata & Heeks, 2015)
  - build connections among open data stakeholders (Mayer-Schönberger & Zappia, 2011)

Gap & Motivation

- In-depth studies on open data intermediaries are limited

- Within the limited studies, open data intermediaries are found to face several challenges
    - lack of financial planning (Flores, 2020), over-reliance on volunteers (Reggi & Dawes, 2016), and difficulty in securing data experts (Andrason & van Schalkwyk, 2017)
    - some of the challenges are associated with the lack of development of open data intermediaries' business models (Kitsios et al., 2021; Reggi & Dawes, 2016)

- Before any research-based development of their business models can be carried out, a clear view of the existing business models is needed

- The objective of this extended abstract is to review existing business models of open data intermediaries from the academic literature through a systematic literature review

Background: What is a business model?

- Various definitions of business model
  - "an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues" (Timmers, 1998, pg.4)
  - "the set of activities that [a business] performs to build and use resources to generate, deliver, and monetize benefits (embodied in products and services) to customers" (Afuah, 2018, pg.5)

- Various key components identified by different scholars
  - (1) key partners, (2) key activities, (3) key resources, (4) value proposition, (5) customer relationships, (6) channels, (7) customer segments, (8) cost structure, and (9) revenue streams (Osterwalder & Pigneur, 2010)
  - (1) value proposition (products/services offered), (2) value architecture (technological architecture and organisational infrastructure), (3) value network (relationships with businesses and customers), and (4) value finance (cost, pricing methods, and revenue structure) (Al-Debei & Avison, 2010)

Background: What is a business model? (cont.)

- Despite various interpretations, many recent scholars agree that a business model contains at least 3 elements [as summarised by Afuah (2018); Andreini & Bettinelli (2017); Voigt et al., (2017)]

  1. value proposition: potential benefits for customers
  2. value creation: methods deployed by companies to deliver the value proposition to customers
  3. value capture: payments, not necessarily in monetary form, from customers to companies

- As it is beyond the scope of this extended abstract to define or refine what is a business model, we adopted the 3 elements as a guide in conducting our review

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Research method

- 8 steps of systematic review by Xiao & Watson (2019)
  1. formulate the problem: what are the business models of open data intermediaries in the literature?
  2. develop review protocol
  3. search for literature
  4. screen for inclusion by reviewing the title and abstract
  5. assess the quality of each piece of literature by reviewing the full text
  6. extract data from the literature
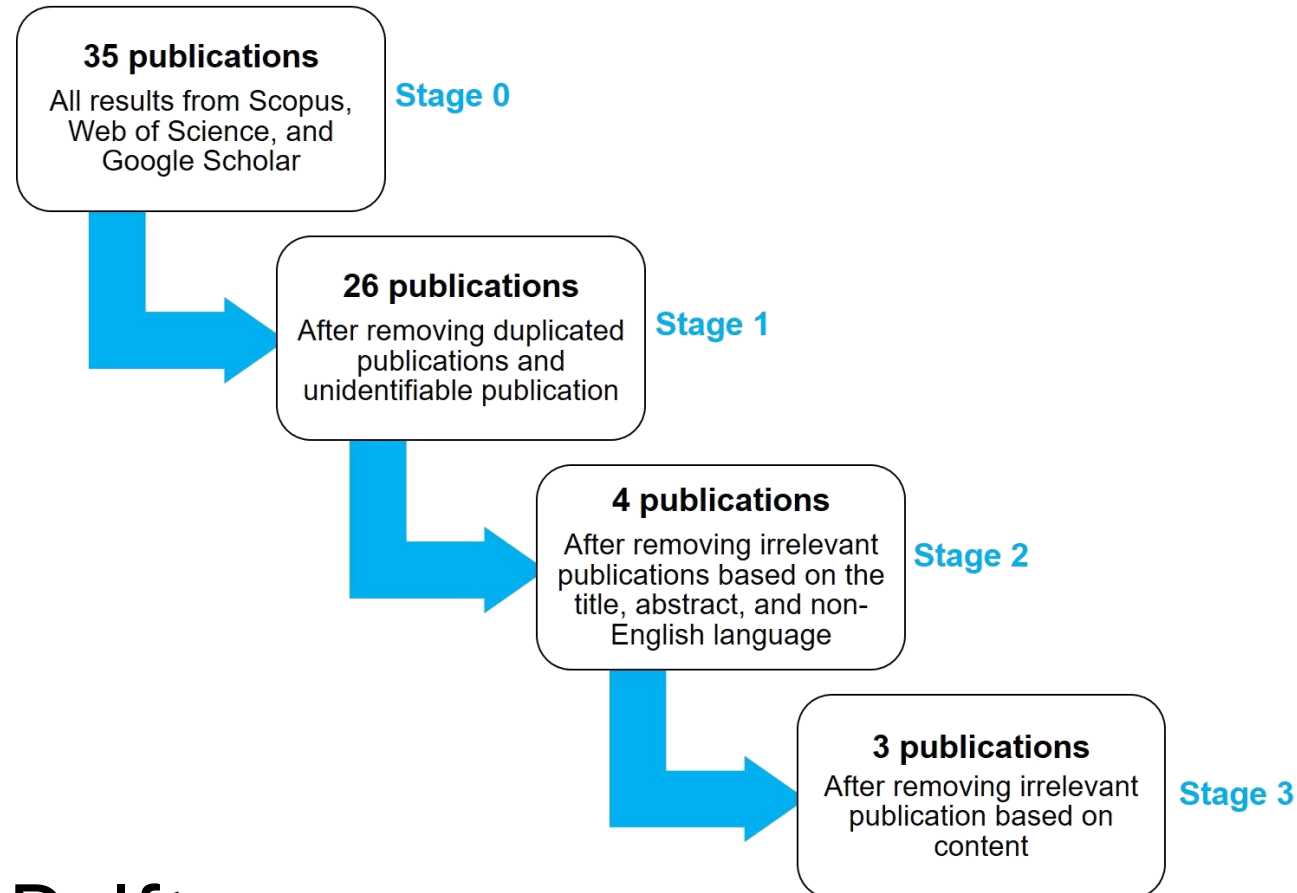 7. analyse the data
  8. report the findings

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Research method (cont.)

- Search literature on 3 academic databases on September 21, 2022
  - Scopus
  - Web of Science
  - Google Scholar

- Search terms

Boolean operator	AND		
OR	open data open government data	intermediaries intermediary infomediaries infomediary intermediation	business model business models revenue value

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Research method (cont.)

- Literature filtering

35 publications
All results from Scopus, Web of Science, and Google Scholar
Stage 0

26 publications
After removing duplicated publications and unidentifiable publication
Stage 1

4 publications
After removing irrelevant publications based on the title, abstract, and non-English language
Stage 2

3 publications
After removing irrelevant publication based on content
Stage 3

Results

Janssen & Zuiderwijk (2014)

- Studied the business models of "infomediaries" in the Netherlands that are driven by open data and social media through 12 cases

- Adopted the concept of business model by Al-Debei & Avison (2010) but in their analysis, they only focused on value proposition

- Identified 6 business models:
  1. Single-purpose apps: Apps that process one type of open data and present it visually
  2. Interactive apps: Single-purpose apps that allow users to add content such as ratings and feedback
  3. Information aggregators: Apps that integrate open data from multiple sources
  4. Comparison models: Apps that aggregate and compare open data from various sources
  5. Open data repositories: Portals that publish open data
  6. Service platforms: Platforms that allow the searching, importing, cleansing, processing, and visualisation of open data

Results (cont.)

Magalhaes et al. (2014)

- Studied the business models of commercial reuse of open government data by 500 firms based in the United States

- Adopted the concept of business model by Al-Debei & Avison (2010) but in their analysis, they only focused on value proposition

- Identified 3 business models:
  1. Enablers: On the supply side, enablers provide public agencies with the services to collect, manage, and publish open data. On the user side, they offer products and services for users to aggregate data from different sources
  2. Facilitators: They simplify and promote access to open data such as by repackaging and republishing data and providing Application Programming Interfaces (APIs)
  3. Integrators: They use open data to complement their internal/private data to augment their business capabilities

Results (cont.)

Germano et al. (2016)

- Studied the business models of seven open government data intermediaries in Brazil

- Identified 3 business models based on the source of revenue:
    1. Consultancy services
    2. Sponsorship to brands that want to advertise on their platforms
    3. Products' subscription

Discussion

- The business models identified from the publications reviewed do not cover all the three main elements considered key in business models (value proposition, value creation, and value capture)
  - Janssen & Zuiderwijk (2014) and Magalhaes et al. (2014) only represent the value proposition
  - Germano et al. (2016) only represent the value capture

- A holistic view of existing business models of open data intermediaries in terms of what value is offered (value proposition), how the value is delivered (value creation), and how the value is compensated (value capture) is needed to propose research-based development of their business models

- Besides, since the three studies reviewed are all country-specific, future studies should consider looking at different geographical scopes

- Due to the limited studies in academic literature, future studies should consider utilising grey literature including use case catalogues (e.g., in opendataimpactmap.org and europa.data.eu)

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Thank you for your attention

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