

# Open Data Business Model Patterns and Value Disciplines

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## Abstract

Business models for open data have emerged in response to the economic opportunities presented by the increasing availability of open data. However, scholarly efforts providing elaborations, rigorous analysis and comparison of open data models are very limited. This could be partly attributed to the fact that most discussions on open data business models are predominantly in the practice community. This shortcoming has resulted in a growing list of open data business models which, on closer examination, are not clearly delineated and lack clear value orientation. We address this problem by 1) consolidating reported open data business models in both academic and practice literature, 2) describe the models based on a business model framework, and 3) determine open data business models patterns. In addition, we identified the emerging core value disciplines for open data businesses. Our results help to streamline existing useful models, and link them to the overall business strategy through value disciplines.

## 1. Introduction

During the last decade, businesses across the globe have struggled to comprehend and adapt to the changes brought on by the ubiquitous growth of Information Technology and the Internet [1], [2]. One of the changes is the emergence of open data which resulting from opening up and sharing of non-sensitive information with other businesses and general public [3], [4]. Open data movement is a great deal of excitement around the world for its potential to empower citizens, businesses, change how government performs, and improve the delivery of public services [5].

Recently, attention of major stakeholders in the open data community, including governments and businesses has shifted to the economic value of open data assets. Therefore, as new entrants flood the marketplace, businesses are seeking to uniquely position themselves through specialization to create and capture value for their stakeholders [6].

Business models and business architectures are conceptual instruments for describing how value is created for customers [6], [7], [8], [9], how revenue is generated, and how value is captured [10], [11], [12]. Business models developed to harness the potential value of open data are increasingly available but not well understood. There are very few scholarly studies on business models for the open data industry. The lack of rigour (e.g. the use of a proper conceptual framework) in describing and analyzing existing Open Data Business Models (ODBMs) makes delineation and comparison of the models difficult. In fact, ODBM are used interchangeably with revenue models, pricing strategies, distribution models, marketing techniques and architectural models [15], [17]. For example, while Howard [15] claims that Open Source is an ODBMs, The 451 Group [16] claims otherwise. Yet another example is the use of different names and labels for very similar business models making analysis difficult.

We address this problem by consolidating reported ODBMs in both academic and practice literature, rigorously describes the models based on a business model framework, and determining the ODBMs patterns. In addition, we identified five emerging value disciplines for open data businesses.

## 2. Existing Business Models

A number of ODBMs have been identified in literature, mainly in the practice community. These include: Howard [15], Ferro and Osella [17] identified eight ODBMs: Premium, Freemium, Open Source, Infrastructural Razor & Blades, Demand-Oriented Platform, Supply-Oriented Platform, Free as Branded Advertising and White-Label Development. Models identified by Musings [18] are: Cost Avoidance, Sponsorship, Dual Licensing, Support and Services, Charging for Changes, Increasing Quality through Participation, and Supporting Primary Business.

Suhaka and Tauberer highlight business model for re-use of open data. They include: Advertising, Pay Services, Start-up, Crowdfunding, Non-profit, NGO, Multi-Agency, Academia, Consortia and Government [19]. Aforementioned models are not clearly defined and mix many concepts. Therefore, we did not include them in the study.

## 3. Conceptualization

Our conceptual model is grounded in the extant literature of business models, as shown in Appendix 1. By consolidating elements of the different business model frameworks, we identified six core elements of business model. We refer to our resulting framework as the 6-V business model Framework (see Figure 1). The elements of the 6-V framework include Value proposition; Value adding process; Value network; Value in return; Value capture; and Value management.

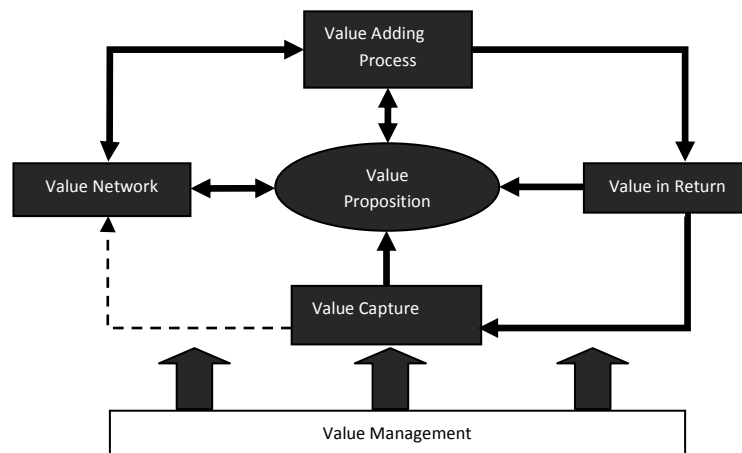


Figure 1. The 6-V framework

## 4. Model Elaboration

We apply the 6-V framework described in section 3 to characterize the 15 ODBMs highlighted in Section 2. We do not include Value Management in the analysis because it executes control over the performance of entire model to ensure the components are set appropriately to meet the objective/s. For each model we describe, the value propositions, core activities of the value adding process, the network of stakeholders required to collaboratively deliver the value, specific value produced and how the produced value will be captured. The resulting information is presented in Appendix 2.

## 5. Analysis

The ultimate goal of understanding the business model variations in the digital world is to be able to analyze them to address real-world problems that the business faces. Its one thing to understand what business model mean for different businesses, but it's quite another for a business to be able to distinguish different business models and understanding what business model suits the business.

We will address these issues by seeking commonalities in the 15 ODBMs based on the 6-V framework. This gives us insight into what are the core ODBM patterns or categories available and the value disciplines for these models.

### **5.1. Business Model Categories**

According to the conceptual model in section 3 – showing the central position of value proposition – the starting point when designing a new business model is articulating a value proposition. Value proposition provides the scope for the business and identifies how the business proposes to realize its revenue and profit. Therefore, we based our analysis approach to determining business model categories on each model value proposition. We looked for similarities in terms of value proposition and we carefully compared what each model is trying to achieve and how.

Our analysis resulted in five major categories in which each category consists of one or more business model/s. *Categories are Freemium, Premium, Cost Saving, Indirect Benefits and Razor-Blade categories.*

### **5.2. Value Disciplines**

A business model – and value proposition in particular – is shaped by the business's underlying value discipline which describes different ways a business can differentiate itself from competitors. It is a strategic focus that enables a business to set its vision and objectives. Value discipline helps a business to tailor value disciplines to exactly match the need. Therefore, before identifying business model, defining business value discipline is necessary.

In our analysis, identifying value disciplines is mainly based on the models comparison of value proposition and value in return and clear understanding of their similarities. Determination of the value disciplines enables analysis of the required capabilities to enable attainment overall business objectives. Our analysis of based on table presented in Appendix 2 produced four types of value disciplines for open data businesses. These include *Usefulness, Process Improvement, Performance and Customer Loyalty.*

### **5.3. Summary: Business Model Categories and Value Disciplines**

We categorized the existing ODBMs and constructed the value disciplines for each models to be able to position the existing ODBMs in regard to the categorizations. Different model positioned differently based on the categorization. An open data business which aims to focus on customer loyalty can have two choices for their business model which are Infrastructural Razor and Blades and Premium. Business can choose one depending on business model category they aim to target. For open data businesses aiming at increasing performance as their value discipline can have one choice for business model which is Support Primary Business. Similarly, for open data businesses aiming at improving processes as their value discipline can have one choice for business model which is Cost Avoidance.

Most of the business models are targeting Usefulness value discipline. Increasing Quality through Participation, Sponsorship, Support and Services, Demand-Oriented Platform, Supply-Oriented Platform, White-Label Development, Freemium, Dual-Licensing, Charging for Changes, Open Source

and Free as Branded-Advertising fit themselves to this value discipline. Depending on the business model category, a business can come up with proper business model for the business.

Table 1 shows this positioning.

Table 1. ODBMs and value proposition categories

		VALUE DISCIPLINES			
		Usefulness	Process Improvement	Performance	Customer Loyalty
<b>CATEGORIES</b>	<b>Razor-Blade</b>				Infrastructural Razor and Blades
	<b>Indirect Benefit</b>			Support Primary Business	
	<b>Cost Saving</b>	Increasing Quality through Participation	Cost Avoidance		
	<b>Premium</b>	Sponsorship, Support and Services, Demand-Oriented Platform, Supply- Oriented Platform, White-Label Development			Premium
	<b>Freemium</b>	Freemium, Dual-Licensing, Charging for Changes, Open Source, Free as Branded- Advertising			

## 6. Discussion

Several authors have attempted to represent business models in different ways. Some of them have similarities in terms of the components of the business model while others have new components in their model. Several authors have attempted to represent business models in different ways. Some of them have similarities in terms of the components of the business model while others have new components in their model. Consequently, the conceptual model (6-V) we have developed which is the consolidation of existing business models captures all the components of business models in one place. It enables businesses to have a complete understanding of business model components and their relations. The 6-V and Osterwalder and Pigneur canvas [20] are very similar but 6-V shows the dependencies between components.

Furthermore, in data industry research, we only found limited scientific sources related to ODBMs and existing models were not discussed in terms of the model components. Moreover, ODBMs defined are used interchangeably with revenue model, pricing strategy, distribution model, marketing techniques and architectural model [12], [14]. To come up with a concrete answer, we decided to collect all the existing ODBMs and apply them in our 6-V model.

We deliver unexpected finding by being able to successfully come up with characteristics of each model in terms of the 6-V model. Therefore, our study declares that the mentioned models are ODBMs. In addition, our findings also include five categories of ODBMs. This finding is particularly based on the analysis of the characteristics of each ODBMs. Our categorization shows that more of the ODBMs belong to Freemium and Premium categories. This is mainly because the strategic focus in these two categories is less complicated and more successful cases and experiences have been achieved. Besides, the revenue model of these two categories are similar when the product is offered free of charge and extended when product is offered under Premium.

We identified four open data business value disciplines which can assist business managers to tailor value proposition and shapes every subsequent plan and decision of the business. Nevertheless, there are various researches about the three general value disciplines: Operational excellence, Product leadership and Customer intimacy. While there are very few similarities in terms of vocabulary between the value disciplines in general business and open data business, the differences are visible and on the concept. For example, Customer Loyalty and Customer Intimacy appear to be similar, but very different in terms of the implication and concept more specifically in open data context.

## 7. Conclusion

All businesses, either explicitly or implicitly should employ a particular business model. Similarly, open data businesses must utilize ODBMs. The first and foremost activity of emerging businesses is to identify the value discipline before identifying a particular business model.

We confess that the conceptual business model (6-V), core ODBMs patterns-*Freemium, Premium, Cost Saving, Indirect Benefit* and *Razor-Blade*- and new open data business value disciplines - *Usefulness, Process Improvement, Performance* and *Customer Loyalty*- contribute significantly to business model and ODBMs literatures and assist not only start-ups and SMEs but also big businesses to deliver full value to their stakeholders.

This study provides insight to governments and government authorities by providing knowledge of importance of availability and accessibility of open data for innovation and transparency. This allows more businesses and development of open data products like APIs. For example, with a focus on realistic local solutions, initiatives like CitySDK are working with pilot cities to create uniform APIs that have standard approaches to how APIs expose local government data. Therefore, governments have a new way of saving and making money by becoming a provider for the city. By opening the data, governments let city (businesses and developers) to create products. Governments can also establish partnership with private sectors to benefit. Therefore, governments should seek to identify how publishing open data can be done in a way provides value to general public and facilitates the development of both free and commercial products.

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## Appendix 2

### ODBM's elaboration based on the 6-V model

Models	Value proposition	Value adding process	Value network	Value in return	Value capture
<b>Cost Avoidance</b>	<ul style="list-style-type: none"> <li>Sustainable publishing solution</li> <li>cost avoidance</li> </ul>	<ul style="list-style-type: none"> <li>Publishing data as Linked Data</li> <li>data retrieval</li> </ul>	<ul style="list-style-type: none"> <li>EU, parliaments</li> <li>government department</li> <li>people</li> </ul>	<ul style="list-style-type: none"> <li>Improve the meaning of data and data integration</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable publishing practice</li> <li>proactive data release</li> </ul>
<b>Sponsorship</b>	<ul style="list-style-type: none"> <li>Free data and useful for public</li> </ul>	<ul style="list-style-type: none"> <li>Publishing process</li> </ul>	<ul style="list-style-type: none"> <li>Sponsors</li> <li>clients</li> </ul>	<ul style="list-style-type: none"> <li>Availability of data to public</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from sponsors</li> </ul>
<b>Freemium</b>	<ul style="list-style-type: none"> <li>Free, but limited data services</li> <li>High quality data at some cost</li> </ul>	<ul style="list-style-type: none"> <li>Availability of different machine-readable formats</li> <li>unconstrained numbers of API calls</li> <li>more sophisticated querying,</li> <li>access to data dumps rather than through an API (or vice versa)</li> <li>provision of feeds of changes to the data</li> <li>enhancement of the data with additional information</li> <li>early access to data</li> <li>provision of data on DVDs or hard disks rather than over the net</li> </ul>	<ul style="list-style-type: none"> <li>Clients (mostly consumers B2C)</li> </ul>	<ul style="list-style-type: none"> <li>Limited availability of useful free data to public</li> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from the small % of the free users</li> <li>Charges for additional data or advanced features</li> </ul>
<b>Premium</b>	<ul style="list-style-type: none"> <li>Meeting specific customer data need</li> </ul>	<ul style="list-style-type: none"> <li>Publishing</li> <li>data maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Mostly business clients</li> </ul>	<ul style="list-style-type: none"> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Lump sums Revenue</li> </ul>
<b>Dual Licensing</b>	<ul style="list-style-type: none"> <li>Free data for non-commercial use</li> <li>high quality data for commercial use</li> </ul>	<ul style="list-style-type: none"> <li>Publishing data</li> <li>data maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Developers</li> <li>clients</li> </ul>	<ul style="list-style-type: none"> <li>Limited availability of useful free data to public</li> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from added value services</li> </ul>
<b>Support and Services</b>	<ul style="list-style-type: none"> <li>High value adding data service</li> </ul>	<ul style="list-style-type: none"> <li>guarantees on data availability</li> <li>prioritization on bug fixes (both in data and its provision) for paying customers</li> <li>timely help for customers using the data</li> <li>services around data visualization</li> <li>analysis and mashing with other data</li> </ul>	<ul style="list-style-type: none"> <li>Mostly business clients</li> </ul>	<ul style="list-style-type: none"> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue</li> <li>presence in the service market</li> </ul>
<b>Charging for Changes</b>	<ul style="list-style-type: none"> <li>Free, but limited data services</li> <li>High quality data at some cost</li> </ul>	<ul style="list-style-type: none"> <li>Update data</li> <li>Availability of different machine-readable formats</li> <li>unconstrained numbers of API calls</li> <li>more sophisticated querying</li> <li>access to data dumps rather than through an API (or vice versa)</li> <li>provision of feeds of changes to the data</li> <li>enhancement of the data with additional information</li> <li>early access to data</li> </ul>	<ul style="list-style-type: none"> <li>Mostly business clients</li> </ul>	<ul style="list-style-type: none"> <li>Limited availability of useful free data to public</li> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from added value services</li> </ul>
<b>Increasing Quality through Participation</b>	<ul style="list-style-type: none"> <li>Availability of higher quality data</li> </ul>	<ul style="list-style-type: none"> <li>Update data</li> <li>Cleansed data</li> <li>Feedback</li> </ul>	<ul style="list-style-type: none"> <li>Developers</li> <li>Lawyers</li> <li>Academics and government</li> <li>clients as an active player</li> </ul>	<ul style="list-style-type: none"> <li>Higher quality data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue</li> <li>client satisfaction</li> </ul>
<b>Supporting Primary Business</b>	<ul style="list-style-type: none"> <li>Open data supporting strategic business objective</li> </ul>	<ul style="list-style-type: none"> <li>Publishing data</li> <li>providing APIs</li> </ul>	<ul style="list-style-type: none"> <li>Developers</li> <li>Clients</li> </ul>	<ul style="list-style-type: none"> <li>Improved business results</li> </ul>	<ul style="list-style-type: none"> <li>Revenue</li> <li>customer satisfaction</li> </ul>
<b>Open Source</b>	<ul style="list-style-type: none"> <li>Free data for</li> </ul>	<ul style="list-style-type: none"> <li>Publishing data</li> </ul>	<ul style="list-style-type: none"> <li>Mixed clients</li> </ul>	<ul style="list-style-type: none"> <li>Limited</li> </ul>	<ul style="list-style-type: none"> <li>Revenue</li> </ul>



	<ul style="list-style-type: none"> <li>non-corporate use</li> <li>high quality data for corporate use</li> </ul>	<ul style="list-style-type: none"> <li>Data maintenance</li> </ul>	(B2B,B2G, B2C)	<ul style="list-style-type: none"> <li>availability of useful free data to public</li> <li>Perceived value of data</li> </ul>	from added value services
<b>Infrastructural Razor &amp; Blades</b>	<ul style="list-style-type: none"> <li>Incomplete data at low cost</li> <li>Complete data at higher cost</li> </ul>	<ul style="list-style-type: none"> <li>Update data</li> <li>maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Developers</li> <li>clients</li> </ul>	<ul style="list-style-type: none"> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from data</li> </ul>
<b>Demand-Oriented Platform</b>	<ul style="list-style-type: none"> <li>High quality and reliable data at some cost</li> </ul>	<ul style="list-style-type: none"> <li>Refining Datasets</li> <li>Collecting and cataloguing data</li> <li>harmonizing data in terms of formats and exposed through APIs</li> </ul>	<ul style="list-style-type: none"> <li>Developers</li> </ul>	<ul style="list-style-type: none"> <li>Commoditization and democratization of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenues in exchange for advanced services and refined datasets or data flows</li> </ul>
<b>Supply-Oriented Platform</b>	<ul style="list-style-type: none"> <li>Efficiency</li> <li>scalable infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Data retrieval</li> <li>standardization of formats</li> <li>automated external exposure of data via APIs and GUI</li> </ul>	<ul style="list-style-type: none"> <li>Technology companies</li> <li>publisher (who is selling)</li> </ul>	<ul style="list-style-type: none"> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from potential advertisers</li> </ul>
<b>Free, as Branded Advertising</b>	<ul style="list-style-type: none"> <li>Useful data for the public</li> </ul>	<ul style="list-style-type: none"> <li>Data visualization</li> </ul>	<ul style="list-style-type: none"> <li>Software development</li> <li>Companies</li> <li>developers</li> </ul>	<ul style="list-style-type: none"> <li>Perceived value of data</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from Adverts</li> </ul>
<b>White-Label Development</b>	<ul style="list-style-type: none"> <li>Useful data services and Apps</li> </ul>	<ul style="list-style-type: none"> <li>App making</li> <li>App upgrading</li> </ul>	<ul style="list-style-type: none"> <li>Mostly Business Clients</li> <li>developers</li> </ul>	<ul style="list-style-type: none"> <li>Save development time and budget</li> </ul>	<ul style="list-style-type: none"> <li>Lump sum Revenue</li> </ul>