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Citation: Baden-Fuller, C., Giudici, A., Haeffliger, S. & Morgan, M. (2017). Business Models and Value. Academy of Management Proceedings, 2017(1), doi: 10.5465/ambpp.2017.90

This is the accepted version of the paper.

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Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/18177/>

Link to published version: <https://doi.org/10.5465/ambpp.2017.90>

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BUSINESS MODELS AND VALUE: ANALYTICAL COMPARISONS OF SCALABLE SOLUTIONS AND DIGITAL PLATFORMS¹

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INTRODUCTION

This paper builds on insights drawn from the marketing, strategy and entrepreneurship literatures concerning consumer value to identify four fundamentally different sets of arrangements - ideal types, that are depicted as ‘business models’. These describe how firms can engage with consumers to create value for them in different ways, and we give precise boundary conditions for an ordering of these types.

We begin by distinguishing issues of the *content* of the business models from issues of *methodology* of the role of those models - that is between what aspect of business arrangements is being discussed from what notion of model is being used. On the *content* side, the most relevant strand of the literature that connects with our agenda is the conceptual approach - although rooted in an empirical tradition - that gives value a central role (Teece, 2010). This sees the business model as a summary representation of how to deliver value to consumers via mechanisms through which firms mobilize technology to make money from consumers that can be described in terms of flow charts, diagrams, mathematically or in text.

On the *methodological* side, we make use of, and indeed meld, three approaches (two of which are highlighted in the literature survey by Massa et al., 2017). The first of these sees the business model as a cognitive device, used by managers to make sense of the world. In this approach the business model forms the basis for thinking about and guiding managers’ actions, including how they construct value propositions (Baden-Fuller and Morgan, 2010). This can be constitutive in that observations can inform their understanding of the model and model-thinking can inform their actions (Porac, Thomas and Baden-Fuller, 1989). At the same time, thinking in terms of business models may facilitate the abstraction of common relational structures that firms’ decision makers can store as cognitive schemas (Gentner, 1983).

¹ Financial support for this paper and the wider project *Building Better Business Models* came from EPSRC (EP/K039695/1) and Mack Institute, Wharton, U. Penn. Special thanks for intellectual contributions from our many project collaborators. The grant holder and publisher is required to make this work freely available by law.

The second approach recognises that models are used as cognitive devices for scholars too. Here their usefulness depends on their characteristics, namely that business models are not purely descriptions but have the resources to act as reasoning tools that can be manipulated to reveal new insights not previously appreciated about the world and/or about our theorizing about the phenomena of the world (Morrison and Morgan, 1999; Morgan, 2012). Of course, the model descriptions, model findings and modelling ideas - these cognitive devices found in scholarship - may easily travel to make their way into the managers' world views, thinking and actions.

Thirdly, in constructing these cognitive-manipulable models we do so as ideal model-types. Utilizing Weber's classic label and approach, these ideal model-types are not a synthesis of real world observations but they are informed by such evidence, while at the same time the building of the model-types relies heavily on ideas and theories about how values are created and captured by firms (Doty and Glick, 1994). Ideal types – i.e. mental constructs that mediate “between our ideas and theories on the one hand, and the things in the world we want to describe and explain in immediately practical ways” (Baden-Fuller and Morgan, 2010: 161) – have been a highly influential notion in modern social science since Max Weber (1904).

So, in this paper we frame the business model in idealized or conceptual terms, but still as a cognitive device that focuses on consumer-firm relationships, and in particular on the boundary between the firm and the consumer (the ultimate customer). The models we develop and analyze in the next section place the demand-side perspective as central. Using these business models as models - as pieces of analytical machinery - allows us to consider more carefully the critical question: How much of the value that is created for consumers can be captured by firms? And the analysis can be extended to business to business arrangements providing, we always keep in mind the final user's perspective.

IDENTIFYING DIFFERENT BUSINESS MODEL TYPES

Table One (shown on the next page) illustrates our 4 business model types. Our first set of principles for constructing our ideal-type business model categories are that consumers are co-producers of value, and that this co-production involves creativity and ingenuity which can give rise to 2 different outcomes. In this first pair of dyadic arrangements, the product and solutions business models, there is no other independent customer involved in the construction of value, however there might be more than one supplier (Teece, 1986).

The *Product Business Model* is the most ubiquitous for physical products and occurs when the consumer's creative use value activities takes place after purchase and away from the producer. According to Vargo and Lusch, 2004 and 2008, a good or service (that can be tangible or intangible) is worthless unless the final consumer does something with it.

The *Solution Business Model* occurs when the producer of the good (or service) directly engages the consumer in the production process resulting in consumers' use value being co-created (see Bateson, 1977; Gronroos and Voima, 2013). That is, the consumer is more involved than if (s)he consumes separately. We note that the term 'servitized' is sometimes used instead of 'solution'.

Table 1: Four Fundamental Model Types

BM Type	<i>Consumer use value</i>	<i>Example</i>	<i>Model: consumer-firm interactions</i>	<i>Literature</i>
	<i>Dyadic</i>			
<i>Product</i>	<i>Consumer obtains value through consumption after purchase</i>	A washing machine used at home; Frozen food that is cooked and eaten at home	Dyadic Product Transactional – Producer puts product (or service) on market via a value chain with limited interaction after purchase.	Marketing: Vargo and Lusch, 2004
<i>Solution</i>	<i>Consumer obtains value by consuming in presence of and with help from the provider</i>	A meal that is consumed in a full service restaurant; A strategy consultant that works with the consumer to co-create a solution.	Dyadic Solution Relational - producer and consumer co-create in real time.	Marketing: Eiglier and Langeard, 1976; Gronroos and Voima, 2013
	<i>Triadic</i>			
<i>Matchmaking</i>	<i>Consumer obtains value from reductions in search effort in finding a good or service</i>	Renting a previously unknown apartment via an independent platform provider An auction house that connects buyers and sellers	Triadic Matchmaking – A platform that connects consumers with suppliers saving search effort	Economics: Marshall, 1890
<i>Multisided</i>	<i>Consumer obtains value from consuming a product or service and gains additional value on account of interactions with others</i>	A free newspaper offering content and advertisements both of which are valued by readers. A web-based free game that contains advertising valued by the players	Triadic Multisided – A platform that supplies a good or service that contains additional benefits from 3 rd parties – that typically pay for the whole package	Management and Industrial Economics Economides, 1996; Rochet and Tirole, 2006

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Our second principle for constructing our ideal type categories and the second pair of business models is that value to the consumer can be enhanced by brokerage that connects the original consumer to others. Such brokerage has been made easier with digital technology, but it is not a situation exclusive to digital. We identify two arrangements that follow this *triadic* (or multi-actor) principle in contrast with the dyadic arrangements where value is created solely by the producer of the product or solution. Our distinction between dyadic and triadic business models resonates with the literature on technology strategy, in particular the contributions of Thompson (1967), and

Stabell and Fjelstad (1998) who show that firms can choose between different kinds of value networks, as well as some of the economics literature on networks (Economides, 1996).

The *Matchmaking Business Model* is called triadic because it involves at least 3 actors: the firm that organizes the market (often called the platform owner) and 2 customers groups, buyers and sellers who trade an underlying good or service. The matchmaker creates value. For consumers, this saving of search effort means that they can enjoy greater use value from the good or service provided via the matchmaker compared to the dyadic situation. For the firm providing the service, this increase in use value is the source of potential profit.

The (triadic) *Multi-sided Business Model* also requires 3 or more parties: the firm (also called the platform owner) establishes a set of relationships between two or more *otherwise disconnected* customer groups. The first group is called the *consumer beneficiary who receives* a set of products or services at a price that is “below cost” that is paid for by a second group called the “paying-customer” that gains profits from creating value for the consumption of the first group. The first group can be business customers provided they represent faithfully the final consumers. Central to this business model is the mechanism that connects the two groups, that is the mechanism by which the paying customer (the second group) gets benefit from the consumer beneficiaries (the first group) using the product, and that, in addition, the consumer beneficiary (the first group) gets benefits from the presence of the paying customer (the second group).

Our multisided business model is a situation of complementary customers and must not be confused with other kinds of platforms of complementary (dyadic) products. The sheep farmer who sells wool and meat runs a platform but is not in a triadic relationship, as those that buy meat care not who buys the wool, and vice-versa. And a firm sells hardware (for example a games console) and then it sells the software for the hardware (such as a game) –is not usually in a triadic relationship because there is only one final consumer. But where the software itself makes connections with other unconnected customers – such as advertisers – then the business is triadic, because there are two independent consumer-customer groups, advertisers and games players, that create complementarities for each other potentially increasing profits to the platform owner. In our triadic business model arrangement, the firm needs to consider closely the prices that are charged to each of the two different customer groups, (Rochet and Tirole, 2006; Parker and van Alstyne, 2005).

VALUE COMPARISONS

In Table 2 (shown on the next page) we summarize our value comparisons. We first compare the two dyadic arrangements, and our approach follows Marshall whose seminal work analyzed the relationship between use value and profit potential – more consumer use value means more profit potential. It is clear that the solution business model gives rise to potentially greater use value than the product business model because the co-location in time and space of production and consumption allows the consumer to engage directly with the producer resulting in a better understanding by users of the product, and the producer can adjust the offer in a tailor-made fashion to improve the consumer experience.

Table 2: Comparative use value of the 4 models

	<i>Consumer use value</i>	<i>Comparative statics</i>	<i>Key boundary condition</i>
	<i>Dyadic</i>		
<i>Product</i>	<i>Product: Consumer obtains value through consumption after purchase</i>	Base line case – because this is the dominant model in advanced economies	The production system for the product benefits from scale economies – at least to some point
<i>Solution</i>	<i>Consumer obtains value by consuming in presence of and with help from the provider</i>	Produces more use value than the product BM, but its appearance depends on costs of solutions not rising with scale	The solutions model is “scalable” – and technology appears to be a key driver for this
	<i>Triadic</i>		
<i>Matchmaking</i>	<i>Consumer obtains value from reductions in search effort in finding a good or service</i>	Matchmakers provide complementary services – they add significant use value if the underlying product is not well known or hard to obtain	There is information asymmetry in the market
<i>Multisided</i>	<i>Consumer obtains value from consuming a product or service and gains additional value on account of interactions with others</i>	Produces more use value than the product BM providing there are positive gains in value from presence of second side	There must be another paying customer group, that group must obtain value from the consumers’ consumption and, finally, the consumers get use value from the presence of the paying group.

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Whether offering the solutions is also more profitable to the firm than offering the product alone is dependent on individual firm and consumer considerations – not on the ideal type business model. We distinguish between non-scalable and scalable solutions. Non-scalable solutions such as restaurants, management consultants, and capital goods repair companies that require large armies of people, and physical and time proximity all of which led to high costs not reduced by scale. Scalable solutions are observed where digital sensors and the related digital technology (that connects these sensors to firms undertaking support activities) allows service centers to connect to products in a seamless manner so that the producer can offer a reliable solution at a similar cost to the product business model, with no disadvantage when scaled.

Our proposition is that when solutions are scalable, then the solution is *always more attractive to the consumer and more profitable to the firm* than the product equivalent. We further note that with the solutions business model – some level of price discrimination between consumers (that is charging different amounts for similar packages) is likely to be easier because the firm has more knowledge of its customers, giving rise to the possibilities of serving more marginal

customers (who might be excluded under the product only offer) and so the possibility of capturing more use value and so higher producer profits.

When we compare the triadic cases we note that the true matchmaker provides valuable complementary services to the product (or solutions) business model. It can extend the reach of its supplying customers because it reduces the search effort of the buying customers (consumers). It can also add other kinds of value, such as being an aggregator of information from past users and rival suppliers, perhaps using a website with feedback mechanisms (something that is quite difficult for the supplying firms to do for they may not be perceived to be independent). The size of the profit available to the match-maker depends on whether the underlying product offering is well known to the market, or easy to access, or if known has a certain reputation. Matchmakers can offer significant value (and hence win significant profits) when suppliers are reclusive (as in art markets) or are not normally in business (as in the apartment sharing businesses) or are undertaking activities far from the originating firms usual territory (as do agents for complex offers who work in foreign markets). At the other extreme, if the firm organizing the product (or solutions) business model is able to reach all its potential customers and if it is also able to provide them all the available information about its products or services, then there is no untapped value left for the matchmaker. This consideration should make it clear that the matchmaking business model is complementary to that of the product (or solutions) business models.

When comparing the product business model to the (triadic) multisided business model – there are 3 issues at stake. First, there must be a product or solution offered to a using customer that gives rise to consumer use value; and we assume without loss of generality the costs of doing this with the triadic multisided arrangement are not different from the product equivalent.

Second, there must be another group, called the paying customer – that gets a gain from the consumption of the first group. This gain could be when data collected from the first group is useful to the operations of the second group, or because the first group is exposed to advertising or some other service from the second paying group. And in the case of a charity, the second group could also be consumers who get use-value from the first group's consumption – they appreciate the fact that the poor are given relief. For the business to be profitable the firm (platform owner) must facilitate the flow of these benefits (perhaps at an additional cost to the firm), even though the actual benefits will accrue outside the boundaries of the firm. Without such facilitation, and associated benefits, there is no incentive for the paying customer to pay the firm any fee. In considering this issue, there is a strong incentive for the firm (the platform owner) to lower the price of the product or solution to the beneficiary user group, as more sales to those users gives rise to additional revenues from the paying group (and we assume that there are no scale related problems in this respect). When the platform-firm follows this course of action, the consumer-user can enjoy a greater value - in the Marshallian analysis more can be obtained and greater utility enjoyed due to the lowering of the price. Recent research has suggested that the extreme case of “zero-priced” goods for the beneficiary group are consistent with even greater value (see for instance Shampanier, Mazar and Ariely, 2007).

The third issue is the reaction of the beneficiary-user to the existence and activities of the payer group. The best case is when interaction is positive as occurs when the paying side brings information that is valuable to the user – as is the case of a search engine supported by advertisers that bring content. It is possible that there is no benefit (or at least no individual, or immediate benefit), as for instance is the case where a hospital sells data collected from its patients (typically with their knowledge and consent) for the benefit of future medical research.

Alternatively, the effect maybe negative, as is often the case where the paying group's advertising is intrusive on the enjoyment of the beneficiary-user.

When there are serious negative responses from the users to the arrival of the paying side, it is clear that the triadic model may fail. However, in the case where the paying side brings benefits to the using side, we can say that value is unambiguously increased and the profit to the organizing platform-firm is *always greater*. The complementarity between customer groups (beneficiary and paying) on account of network effects gives rise to a valuable combination (Economides, 1996; Rochet and Tirole, 2006).

In Table 3 (show below), we draw together the implications of our analysis here by highlighting the importance of the two factors: scalability and existence of complementary benefits to different end consumer-customers, that we have treated when considering the profitability of the firm under three different, potentially competing, business models: the dyadic-product, the dyadic-solutions and the triadic-multisided.

Table 3: Demand Side Scale and Scope Economies

	User-Value scale economies NOT present	User-Value scale economies present
User-Value scope economies NOT present	<i>Product Model dominates</i> when solution type is COSTLY to scale and there are strong NEGATIVES for the consumer from existence of payer in triadic model	<i>Solution Model dominates</i> <i>indicating economies of scale</i> when solution type is CHEAP to scale and there are strong NEGATIVES for the consumer from existence of payer in triadic model
User-Value scope economies present	<i>Multi-sided Model dominates</i> <i>indicating economies of scope</i> where solution type COSTLY to scale, but where there are POSITIVE gains for the consumer from existence of payer in triadic model	<i>Multi-sided Model where</i> <i>underlying offer is a solution</i> <i>dominates indicating both scale</i> <i>and scope economies</i> where solution type CHEAP to scale; POSITIVE gains for the consumer from existence of payer in triadic model

IMPLICATIONS

We suggest that our analysis helps explain an important and counter-intuitive phenomenon that is commonly observed in a world where digital technology is becoming more pervasive; and that these observations trigger possibilities for further research. First, advertising supported free games are widely circulated on the web, yet most serious gamers avoid advertising supported games – preferring the digital freemium arrangement – our analysis suggests that this is because the benefits of the advertising within the game (cause of amusement and fun with non-serious games) is a distraction and annoyance to serious gamers. Yet, advertising supported credit scoring websites that require users to input personal data that is shared with multiple providers are proving to be very successful – because these sites specialize in locating loan providers that can offer “pre-approved” loans to searchers based on the information they have already provided – an attractive service especially to those that are cautious about approaching lenders directly. These advertising supported platforms, operating in a serious space where data sharing is normally considered to be undesirable, show how the “other side” can provide additional value.

Second, as hinted earlier, our analysis points to why so many firms are moving towards the scalable solutions business model – that had been previously seen as a low opportunity niche. In areas such as capital goods, the scalable solutions business model can give rise to two benefits – first there is the possibility of increasing the level of demand due to benefits that flow to the final consumer and, second, the solutions business models often give rise to greater opportunities for price discrimination. With the scalable solutions business model, the customer provides the supplier with data about the reasons for use and insights into value created – and with this information the supplier has more possibilities for exploiting market imperfections.

Finally, we suggest our analysis may be important for the literature on platform competition. Extant discussions of platform competition typically pose the platform as always more effective than a product equivalent, with examples from selected digitally based industries, and where discussion of alternatives are often offered as peculiarities or puzzles. Our analysis lays out clearly the value of principled-based reasoning that clearly explains the boundary conditions for effective envelopment. By pinpointing more clearly these boundary conditions of scale and consumer benefits or losses, we enrich their analysis by pointing out how it is possible for a product or solution-based business to dominate a multisided platform.

Our analysis of the four different business models also enables us to make sense of something often observed but not always explained, namely that the world is rather full of small firms using the *non-scalable* solution business model, that the product model is the second choice, and the scalable solutions and multi-sided typically come last. The fact that the non-scalable solutions come first does not seem consistent with the rank order of profit potential, nor is it consistent with the capabilities perspective on the firm – because solutions require more skill not less than the product business model. Nor is this consistent with the view that firms should adopt the latest technology, especially when it reduces costs and improves product performance when viewed from the producer’s perspective. So why is this so? The focus of our ideal type categories on the consumer experience gives an insight - the relevant property here is the ease with which these different firm types engage with customers. The solutions model is the easiest model to set up - it involves direct engagement with customers and customer feedback and so can increase consumer value. By contrast, in the product business model, the firm is not so close to consumers and has less knowledge of and from them. That problem of gaining customer and consumer knowledge is compounded in the multi-sided business model set-up.

Our analysis suggests how these two observations fit together. Until recently, most technological advances impacted on the performance of the product or service, with consequent improvement in consumer value, but with little impact on the performance of the business model itself. Digital is however different from other technologies, because improvements in digital technology have also altered the relative attractiveness of different business models in some industries, and for some products or services, with improved value gained by consumers and so profits by firms, such as freely accessible online sources of encyclopedic knowledge supported by donations (most prominently Wikipedia). Our analysis of business models helps us to clarify the importance of different technological changes, and identify whether they prompt changes within the same business model type or across types. (Chesbrough, 2010; Teece, 2010).

A central empirical question that our categories raise is whether and how digital technology allows triadic business models to become much easier to operate. It is exactly this principle-based approach to business model thinking that will allow research to proceed: separating technological innovation from business model change using our analytical tools.

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