

**Value propositions for disruptive technologies:
Reconfiguration tactics in the case of electric vehicles**

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Abstract

Disruptive technologies tend to underperform on attributes that are considered as key attributes of incumbent technologies and require new value propositions to increase mainstream customer appeal. Yet, how do firms reconfigure their value proposition as a way to overcome the technological inferiority of disruptive technologies? This paper conceptualizes and empirically investigates the process of value proposition reconfiguration. Based on evidence on the commercialization of electric vehicles, it explores the tactics firms use to reconfigure value propositions to increase market acceptance from mainstream customers. The paper develops a framework showing three reconfiguration tactics: compensating, enhancing, and coupling tactics.

Key words: business model; disruptive technology; value proposition; value proposition innovation, disruptive innovation; electric vehicles

Disruptive technologies have the potential to reinvent a product by introducing new attributes that could become a key source of competitive advantage.¹ Yet, initially only customers on the fringe tend to value such new attributes. Breaking into the mainstream remains a challenge, because these technologies seem to underperform on more established attributes mainstream customers currently value most.² Disruption occurs only when these customers also make the switch to the new technology. This happens when product performance on established attributes has improved to an acceptable level and mainstream customers have also started to value the new attributes.³ However, this could be a lengthy process.⁴ For instance, 3D printing holds the promise to disrupt the spare parts market for many industries. At present, however, the printed parts are not fulfilling the durability requirements for many applications and the technology is still rather expensive for most firms. The potential for market disruption will be undermined if mainstream customers fail to show interest because the initial underperformance on established attributes has not improved

fast enough.⁵ While technologies hold promise to be disruptive, a prolonged underperformance could lead to a failure to live up to this promise.

Scholars have argued that firms can overcome this challenge of disruptive technology's initial underperformance through business model innovation.⁶ An inferior technology might still succeed if combined with an inventive business model.⁷ As Chesbrough argues, "an inferior technology with a better business model will often trump a better technology commercialized through an inferior business model."⁸ To that end, to improve a disruptive technology's appeal to mainstream customers, firms can reconfigure the value proposition, a business model's main component to engage with customers.⁹ Value proposition reconfiguration would allow a firm to change the customer perception of established attributes, when it is still in the process of improving these technologically.

In this paper we advance understanding of the process of value proposition reconfiguration as a way to improve a disruptive technology's mainstream customer appeal. We analyze reconfiguration tactics firms use in the case of electric vehicles, a technology that could disrupt the car industry. We develop a framework that shows three overarching tactics that firms applied to reconfigure product attributes – compensating, enhancing, and coupling tactics – and discuss the influence on the technology's attractiveness to customers.

Value proposition reconfiguration tactics: a framework

A value proposition is the promise of value to customers and has been studied extensively in the field of marketing.¹⁰ Firms can use the value proposition for differentiation purposes,¹¹ if the "value proposition represents an offering to customers that adds more value or solves a problem better than other similar competitive offerings".¹² Anderson and colleagues view a value proposition as a bundle of value elements.¹³ During the purchase decision process, customers compare a value proposition's elements with those of the best

alternative available and make a decision based on the overall benefit a product offers.¹⁴ A firm can transform a weak proposition by dissecting it into value elements and improve elements on which it underperforms compared to the best alternative.¹⁵

Value elements come in different types: *points of parity* (an element provides the same performance compared to the best alternative), *points of difference* (an element provides superior or inferior performance compared to the best alternative) and *points of contention* (there is disagreement about an element being superior or inferior). Once all value elements are assessed, a firm can design a superior value proposition. Intuitively a firm might design a value proposition in the strategic sweet spot, i.e. emphasize all superior value elements that customers appreciate and are distinct from the competition.¹⁶ It would be better, however, if a value proposition design is based on only a few distinctive elements; it should also have points of parity with a competitor's value proposition to gain market acceptance.¹⁷

The original framework of Anderson and colleagues only partially cover features relevant to disruptive technology. Disruptive technology has the problem that the points of difference only appeal to a small group of fringe customers. Figure 1's intersecting circles illustrate that a disruptive technology's bundle of value elements is comparatively smaller than an incumbent technology's bundle. It covers a small part of the customer value (areas 5 and 6) and only appeals to niche customers with its distinctive feature of area 6. Over time, the disruptive technology's circle grows when it improves and starts to cover a larger share of the customer value. Nonetheless, due to perceived points of inferiority (area 4) disruptive technology faces difficulties attracting mainstream customers so long as these points are not at an acceptable level. Technological improvement would solve this problem, but value proposition reconfiguration could achieve this more rapidly. A reconfiguration would change the customer perception of inferiority without changing the technology itself.

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Add Figure 1 and Table 1 here

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To show how a firm can reconfigure its value proposition, we build on the original framework¹⁸ (areas 4, 5 & 6 in Figure 1) by introducing seven value proposition classes (see Table 1). *Points of Parity* (5) are elements where both technologies perform equally. We unpack the original class of points of difference into points of superiority and inferiority. Disruptive technology excels on *Points of Superiority* (6). In contrast, *Points of Inferiority* (4) are those value elements an incumbent technology addresses, but a disruptive technology fails to address. Extending the original framework, *Points of Opportunity* (1) are elements customers would value but neither technology addresses. *Points of Untapped Value* (3) are a disruptive technology's elements that could add value, but have not yet been exploited. Finally, *Points of Incumbent Overshoot* (2) and *Points of Overshoot Parity* (7) are neither relevant to customer values nor have this potential. These two areas cover an incumbent technology's value elements that failed to attract customers in the past. Doubts can be raised whether they will do so in the future.

Figure 1 suggests that firms can follow different approaches to reconfigure a value proposition. A firm can apply specific reconfiguration *tactics* to make sure that a product based on disruptive technology is at least “good enough” compared to the best alternative it intends to replace.¹⁹ In the business model literature, Casadesus-Masanell and Ricart refer to tactics as “the residual choices open to a firm after choosing its business model”.²⁰ They argue that tactics influence “how much value the firm will be able to create and capture at the end of the day”.²¹ With regard to value proposition reconfiguration, tactics show how a firm can change value elements to create customer appeal. As the value proposition forms an essential component of a firm's business model, value proposition reconfiguration will impact the

overarching business model.²² Reconfiguration tactics could leave the existing business model mostly intact, but also be more radical, resulting in a new business model.²³

In short, firms can choose to reconfigure their value proposition to rapidly change the customer perception of a disruptive technology. As Figure 1 shows, firms can apply different tactics to implement value proposition reconfiguration. Next, we explore which tactics (and combinations thereof) firms tend to choose, which classes of value elements they change, how they make changes, and what the respective effects are on the attractiveness of the disruptive technology.

Data and Methods

To gain insight into value proposition reconfiguration, we analyzed value propositions of electric vehicles (EVs). While EVs have seen an increase in sales, car firms struggle to break into mainstream markets with their electric models, mainly due to a high price, low driving range and missing infrastructure.²⁴ With the exception of Tesla, incumbents bring most EVs to the market but the overall numbers remain low. Incumbents have experience serving the car market and are familiar with customer preferences,²⁵ but they rely on a business model optimized for traditional cars.²⁶ Instead of designing a brand new value proposition, most car firms reconfigure a value proposition initially developed for cars with an internal combustion engine (ICE).

The study focused on consumer markets in the United States (the world market leader for EV sales) and the Netherlands (an EV lead market in Europe). We analyzed sixteen EV models either on sale in the US, the Netherlands or in both countries. Table 2 provides an overview of all models, the year of introduction, the price, and the range. We added a

conventional economic multi-purpose vehicle for comparison. We gathered information from manufacturer brochures, websites, and press releases and first analyzed the value elements of the value propositions by drawing on studies on consumer perceptions of EVs.²⁷ We then examined the tactics firms used for their EV value proposition and derived three reconfiguration tactics, which were validated in interviews with car firm representatives. Finally, we examined the differences between firms' strategies with regard to value proposition reconfiguration and their respective effects on attractiveness (using sales as a proxy).

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Reconfiguration tactics of EV manufacturers

Based on our analysis of the EV value propositions and the tactics firms used, we found that reconfiguration tactics focus mainly on class 4 (points of inferiority), 6 (points of superiority) and 3 (points of untapped value). With regard to the attributes forming points of inferiority, the reconfiguration was aimed at driving range, price, and charging time and infrastructure. In fact, these elements were central in the reconfiguration efforts. Not only did these elements spur firms to make these critical attributes more equal to conventional cars but they also sparked them to draw on fairly subtle, but superior elements to increase value. For the attributes safety and performance – currently regarded by consumers as points of parity (class 5) – no specific reconfiguration takes place. The firms did employ additional tactics to leverage the favorable features of fuel efficiency, maintenance cost, and pollution reduction as well as several elements that had thus far been untapped (class 3). In the following, we shed light on the tactics targeted at the three most salient points of inferiority: range, price and charging time and infrastructure.

Tactics for driving range. The reconfiguration tactics for driving range can be grouped into three categories: mobility services, software services and hardware services. Looking at mobility services, all firms provide roadside assistance services to customers to make them more confident while being on the road. This tactic is directly derived from the existing ICE business model. The service to temporarily provide customers with additional cars for long-distance trips is a more novel tactic. It is less common, though, only six firms provide this type of service with some variation: it comes standard with the Fiat 500e and Nissan Leaf, but is optional for owners of Renault, Volkswagen (e-Golf and e-Up) and BMW. Nissan and Fiat provide this service in collaboration with car rental firms Hertz and Enterprise Rent-a-Car.

The most innovative tactic for mobility services is car sharing which fits EVs' superior characteristics of reduced maintenance costs leading to improved cost-effectiveness with increased utilization. However, only BMW adopted this for the i3, called DriveNow, which currently runs in the US and several European cities.²⁸ It has been set up in collaboration with car rental firm Sixt. Customers can find an available car via the DriveNow mobile application and drive the car as long as they need. DriveNow does not use designated rental depots so the user can leave the car anywhere. The concept is all-inclusive, using one tariff which includes tax, fuel costs, insurance and parking. According to Peter Schwarzenbauer, board member of BMW Group and responsible for Mobility Services, the DriveNow program is "part of BMW Group's strategic response to the growth in urban living and shared ownership."²⁹

Integrating public transport options into the EV value proposition is a tactic that aims to increase customers' mobility in urban areas. Again, only BMW provides this. The firm Moovit, BMW i Ventures invested in, originally provided this service.³⁰ It is a mobile application that integrates all forms of public transport and provides real-time information about availability of transport modes, congestion and the fastest routes to a destination.

BMW's tactics transcend driving range and provide a complete mobility solution. Integrating competitive modes of transport in the value proposition and providing car sharing services is a disruptive step for a traditional car manufacturer, because it conflicts with the original firm logic to maximize car sales.

Other tactics targeting driving range are software services to inform customers about the current driving range and improve driving efficiency. All firms use dashboard tools to help increase driving range, but there are differences in the level of detail. For example, Mitsubishi i-MiEV provides a simple gauge, the "Eco-zone indicator", that signals how to improve driving efficiency and driving range. In comparison, the Range Assurance of the Tesla Model S is highly advanced. This dashboard tool factors in real-time information about wind speed, height changes, weather conditions, and charging station availability. It calculates where and how long to charge to travel as efficiently as possible. This tool's goal is to "ensure you never unintentionally run out of range, giving you peace of mind at all times."³¹ BMW provides an identical tool. Many firms also provide mobile applications for the same purpose. Ten firms provide a mobile application that informs drivers about their driving range and calculates the most efficient route. Fiat, Ford and Renault use EVs to experiment with these applications, but do not yet provide them as standard with their conventional cars. Mercedes-Benz supplies all vehicles with mobile applications.

Several firms use gamification tools to make customers aware of their driving style and help them driving efficiently. BMW and Nissan have built a platform for feedback on driving style and shows how efficient one is driving compared to others. Chevrolet also adds a competitive element with its Volt Driver Challenge. With this application customers can see how much energy they have saved and set goals to compare their results with others' in the Volt Driver Challenge Community. Volkswagen launched the "Think Blue Trainer" on the

dashboard and as phone app. With this tool customers can choose efficient drive-training modules and receive feedback on driving behavior.

Adding hardware to an EV is another tactic firms use is to reduce range anxiety. Most EVs (11 of 16) come with different drive modes to maximize range. While it is not entirely new in the industry, it is not yet standard in comparable conventional cars. A more radical tactic, unique to the EV, is a range extender. The BMW i3 can optionally provide this feature to almost double driving range. The Mercedes-Benz B-Class Electric Drive delivers a “Range Package” which unlocks additional battery capacity for special occasions to enlarge driving range. Interestingly, Mercedes-Benz advises to not often use this feature, because it has an adverse impact on the battery’s longevity. The Chevrolet Volt and Opel Ampera are positioned as extended range EVs. These cars run on a lithium-ion battery. When the battery capacity falls below a certain threshold, a separate ICE turns on to drive an electric generator that recharges the battery and provides electricity to the electric motor. As a result, these vehicles have a much longer driving range than those without a range extender. The Volt can drive up to 60 kilometers, but the range extender increases this to almost 600 kilometers.

Tactics for purchase price. The high purchase price caused by the cost of the battery is one of the main barriers to EV adoption. The uncertainty about the battery’s amortization (due to regular fast-charging) and subsequent impact on the residual value also contributes to the high price. Tactics related to the battery are therefore categorized under the price attribute. Firms use several tactics to decrease the negative perception of the high price, such as warranties, initial price reduction, and payment constructions. Extending the battery’s warranty is an often-used tactic. Except Mitsubishi and Kia, all incumbents provide a longer warranty for the battery than the normal warranty on conventional cars. Fiat’s regular warranty is four years, for example, while the warranty on the Fiat 500e’s battery is eight

years. Four firms also ensure the battery's capacity above a certain percentage, because regular fast charging has a negative impact the capacity.

Nissan, Renault and Smart are the only ones that directly reduce the EV's initial purchase price by separating the battery from car ownership. Renault obliges customers to rent the battery, while it is an option at Nissan and Smart. Nonetheless, Smart tries to stimulate battery rental with its "sale & care concept". The battery's warranty is remarkably longer when rented (10 years vs. 2 years). There are also several payment constructions that take away the barrier of the high purchase price. An often-used tactic in the car industry is a lease construction, provided by the car manufacturer or separate lease firms. Eleven firms state in their brochure that individual consumers can lease the EV directly from them. Tesla offers consumers the "Tesla Sales option" to make customers less concerned about the residual value of their Model S. Tesla drivers can sell the Model S back to Tesla for a guaranteed price after the end of the lease term (36 or 48 months).

The tactic of all-inclusive packages relates to multiple attributes, including price, driving range, and charging time and infrastructure. Three firms use this tactic. Nissan and Volkswagen have the most complete package. Nissan provides customers in the Netherlands with the "Nissan Unburden Package" that comes free with every Leaf. It includes a home charging station; the installation in collaboration with energy provider Nuon; three years of maintenance services; a Hertz Gold Plus Card to use conventional cars; and assistance with subsidy applications. For e-Up and e-Golf customers in the Netherlands, Volkswagen offers a comparable total solution package that aims to "force a breakthrough in electric driving" and "completely unburden consumers".³²

An EV's unique feature is the possibility to use home-generated electricity from solar panels for recharging. While it does not directly lower the initial price, it helps reducing the total cost of ownership. Five firms have set up partnerships with solar panel providers, but

only in the US. Ford has teamed up with solar system provider SunPower. According to Mike Tinskey, Ford's director of global electrification and infrastructure, the solar system generates enough energy for customers who drive on average 2600 kilometers per month.³³ BMW i3 owners receive a discount from SolarCity to install solar panels to generate their own electricity. They can also lock-in low energy rates for the next twenty years.

Tactics for charging time and infrastructure. Several tactics address the charging time and infrastructure. To reduce charging time, several firms provide a fast charging connection point in their EV. With this hardware tool, it is possible to recharge the battery for approximately 80% in 30 minutes at fast-charging stations. Nine firms provide this tool as standard, while three have it optional. Most EVs come standard with charging cables for regular sockets, but this is not the most convenient way to recharge. It generally takes more than ten hours to completely recharge and the cable does not connect with public charging facilities. Providing charging cables as standard to charge at public stations is less common, only seven firms do this. Smart, Opel and Ford provide these cables optionally, while others do not mention it at all. To make home charging more convenient, some EV manufacturers provide a home-charging station with providers such as Bosch, AeroVironment or Leviton. The majority has non-binding collaborations with these providers, while Tesla, BMW, Smart and Ford supply their own charging stations. BMW has two charging stations, the Wallbox Pure and Wallbox Pro, which charge faster than other stations and can have several user profiles (for accurate billing). These systems also include a load management system to reduce the charging rate when heavy household energy consumption is detected.³⁴ Tesla's home-charging station, the Powerwall, also surpasses the common standard. The driver can program it via the on-board touchscreen. The battery is recharged overnight when energy rates are lowest. In 2015, Dutch energy provider Eneco launched a mobile application,

EnecoSmartCharging, with Tesla. It checks the up-to-date energy prices every 15 minutes and recharges the battery when prices are the lowest.³⁵

The infrastructure tactics suggest that car firms understand that their EV's success depends for a considerable part on the alignment with the charging infrastructure that is completely different from the existing infrastructure for ICE vehicles. Tactics to embed the EV in this new ecosystem vary from applications that navigate to charging stations to non-binding collaborations with charging-station providers or a charging infrastructure built for the brand. The majority provides a mobile application that locates the nearest charging stations. Differences exist between those applications though. The Fiat application just locates the twenty nearest charging stations, while Tesla and BMW check for real-time availability of charging stations and can reserve a charging spot. Several firms collaborate with charging-station networks. Citroën optionally works with The New Motion mobile application and charging network in the Netherlands. Kia and BMW offer customers charging cards from charging station networks at no cost, but customers pay for the actual charging sessions. In the US, Nissan and Volkswagen have set up a more substantial collaboration with charging-station networks. Volkswagen US collaborates with ChargePoint, the largest charging network with more than 18,000 charging stations. It provides Volkswagen e-Golf owners with ChargePoint network cards to use their charging stations, two thirds of which are free.

Tactics for the reconfiguration of value propositions

The analysis shows that firms try to reconfigure their value propositions to make disruptive technologies more attractive, but follow different approaches with varying degrees of impact on their overall business model. We identify three overarching tactics that firms use to reconfigure their value proposition to overcome a perceived inferiority of a disruptive technology: compensating, enhancing, and coupling tactics (see Table 3). These tactics can be

characterized along three dimensions: the class of value element the tactics focus on, the effect the tactics have on the business model, and the outcome on the customers' perception of the disruptive technology. Table 3 provides an overview of tactics identified in the case of EVs and shows how value elements were reconfigured.

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Compensating tactics. Compensating tactics are the most intuitive choice for reconfiguration. They aim to change the perception of points of inferiority (class 4) to make them points of parity (class 5), but leave the existing business model intact. When a technology is perceived as performing 'not good enough' on a salient attribute, the mainstream market will not accept the product.³⁶ Compensating tactics thus focus on tackling a disruptive technology's disadvantages compared to the main attributes of the incumbent technology, such as the driving range or price in the case of EVs. Car firms have compensated EVs' short driving range by providing substitute cars or a fast-charging infrastructure. Alternatively, guaranteeing fixed residual prices and separating battery costs compensate for EVs' high purchase price. The interrelatedness of value elements is still a challenge though. The performance on salient elements influences how customers perceive other elements.³⁷ When salient elements remain inferior, customers may believe that adopting the product still requires too much compromise when new attributes fail to offer sufficient compensation. The main objective of compensating tactics is to ensure that mainstream customers see a disruptive technology as a reasonable choice and improve the technology's legitimacy in the meantime.³⁸ Still, doubts can be raised whether compensating tactics alone are sufficient to win over mainstream customers. We argue that enhancing tactics will better serve this purpose.

Enhancing tactics. Enhancing tactics go one step further and try to exploit points of superiority (class 6) and transform them into points of opportunity (class 1). In this case, customer values are targeted that the incumbent technology does not cover yet. Instead of reaching parity on what used to be seen as inferior elements, enhancing tactics are more ambitious. They leverage the superior value elements of the disruptive technology. To alleviate range anxiety, for instance, firms have added range extenders, which add the benefits of fuel choice and increased acceleration. Driving range has also been tackled integrating alternative modes of transport or car-sharing services, which address untapped customer values and benefit from superior maintenance and cost-efficiency characteristics. Enhancing tactics aim to go beyond the status quo to break new ground by offering value-added services³⁹ or by creating new value not yet seen in the industry.⁴⁰ While enhancing tactics provide the possibility to differentiate the product, they often require a change to the existing business model. As a consequence, for incumbents such tactics can be difficult to implement since they create conflict with the existing business model.⁴¹

Coupling tactics. Coupling tactics differ from compensating and enhancing tactics in being concerned with an entirely different product or service compared to the original. These tactics utilize elements that were Points of Untapped Value (class 3) and turn them into Points of Superiority for a different product or service to create a Point of Coupled Value (class 8). Firms look outside their industry for partners to couple value elements that so far have been idle. BMW, Tesla, Volkswagen, and Nissan, for example, tried to create coupled value with electricity firms, charging-system providers, and solar-system developers. They combine the need for sustainable mobility with the need for energy autonomy.⁴² Coupling tactics use the disruptive technology to tap into new markets. They exploit new combinations of products and services to create Points of Coupled Value which can become more dominant in the future. Coupling tactics not only involve a change of existing business models, but could also

lead to a complete redefinition of markets.⁴³ Firms using such tactics thus pursue a very ambitious, but also very risky strategy.

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Figure 2 and 3 illustrate the three tactics – compensating, enhancing and coupling. It allows comparing the disruptive and the incumbent technology before and after the value proposition reconfiguration. Before reconfiguration, the disruptive technology is less attractive illustrated by the size of area 4, which is larger than area 6. After the reconfiguration, in addition to the already established area 6, the disruptive technology also covers parts of area 1 and 8, resulting in a total share that could be larger than the diminished area of the incumbent technology’s share (area 4). Figure 2 also shows how firms can increase the scope of their value creation by combining different reconfiguration tactics simultaneously. Especially Tesla Motors and BMW have followed such a combining approach. Not only did they try to compensate for value elements that customers perceived as inferior, but they also enhanced points of superiority to tap into points of opportunity (e.g. providing car sharing services and mobile applications) and couple their products by offering the PowerWall and WallBox with providers of home-based electricity systems. These two firms tap into new sources of customer value that the incumbent ICE technology cannot serve.

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The effect of these tactics on the attractiveness of disruptive technologies is reflected in the car manufacturers’ sales figures (see Figure 4). The most successful car manufacturers in terms of sales (sales of more than ten thousand EVs per year) used relatively few

compensating tactics and relatively many enhancing tactics compared to the other firms. However, their use of coupling tactics was limited. Firms that sold between one and ten thousand EVs per year had a similar amount of compensating tactics but made less use of enhancing tactics. Interestingly, these firms had the highest share of coupling tactics. Car manufacturers with the lowest sales figures focused almost exclusively on compensating tactics, engaging very little in enhancing and coupling tactics. The effect of the tactics can also be observed over time. Sales figures in the U.S. over four years (2012 to 2015) indicate that the high-volume firms adopting a balance of compensating and enhancing tactics spearhead sales compared to other car firms (see Figure 5). Only BMW and Fiat witnessed a noteworthy increase in sales.

Conclusions

This paper shows how disruptive technologies can be made more attractive for the mainstream market by a reconfiguration of the value proposition. To conceptualize value proposition reconfiguration, we introduce classes of value proposition elements and propose three reconfiguration tactics: compensating, enhancing, and coupling tactics. Examining car firms' tactics to reconfigure value propositions for their EVs, this study shows that firms can reconfigure their value propositions by combining different tactics and overcome the perceived inferiority of disruptive technologies in a timelier manner than using technological innovation alone.

Our framework helps firms to understand how they can increase the attractiveness of value propositions of disruptive technologies for the mainstream market through an exercise of three steps: disaggregating the current value propositions in comparison to the incumbent technology and customer values (step 1 in Figure 3), classifying the product's value elements in the value proposition reconfiguration diagram (step 2), and applying the three different

tactics to reconfigure their value proposition (step 3). As changing the customer perception of a technology is very challenging, our framework suggests firms to use a combination of different tactics. When firms move from using compensating tactics to enhancing and coupling tactics, respectively, the potential to find new sources of value creation increases. However, this potential does come with the higher risk of leaving behind established and proven value propositions and their overarching business models.

With a more drastic reconfiguration of the value proposition, organizational challenges grow due to the needed changes to the existing business model. Particularly incumbents face the trade-off between serving current customers and cannibalizing existing products. This requires either ambidextrous capabilities to follow a dual strategy within an organization or to pursue the more radical approach moving the venture outside the organization,⁴⁴ e.g. corporate spin-offs like BMW. We would argue that taking such a risk is worthwhile pursuing, as only a comprehensive reconfiguration of the value proposition will make full use of all the potential benefits that a disruptive technology has to offer.

Note

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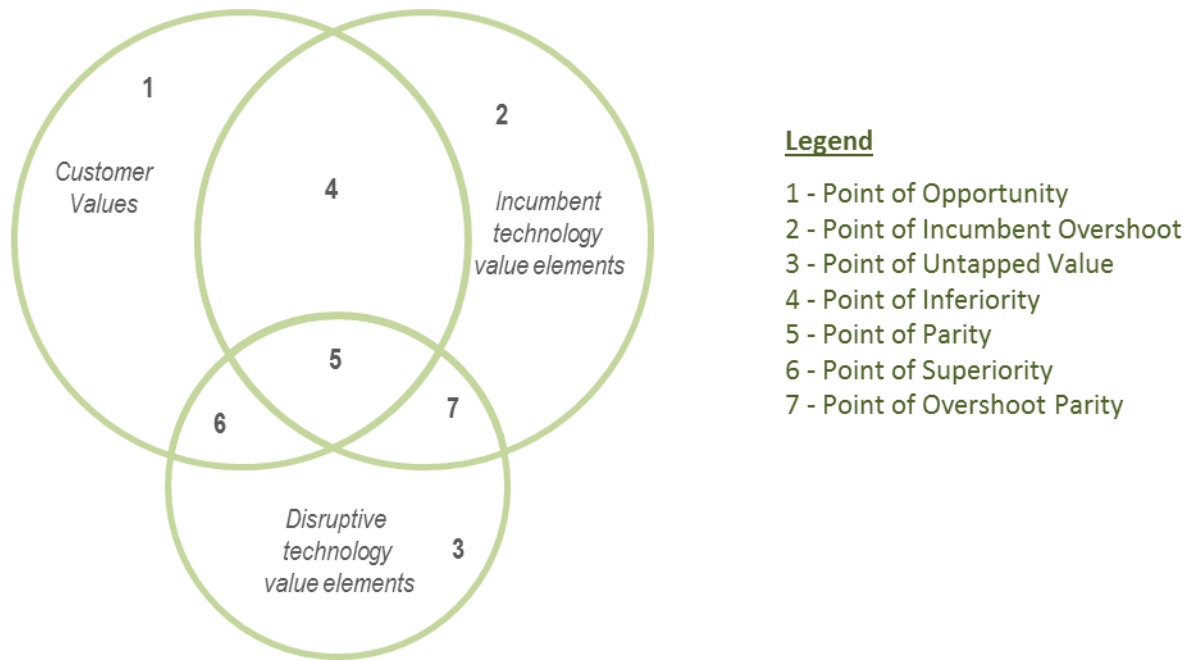


Figure 1: Qualitative classes of value proposition elements

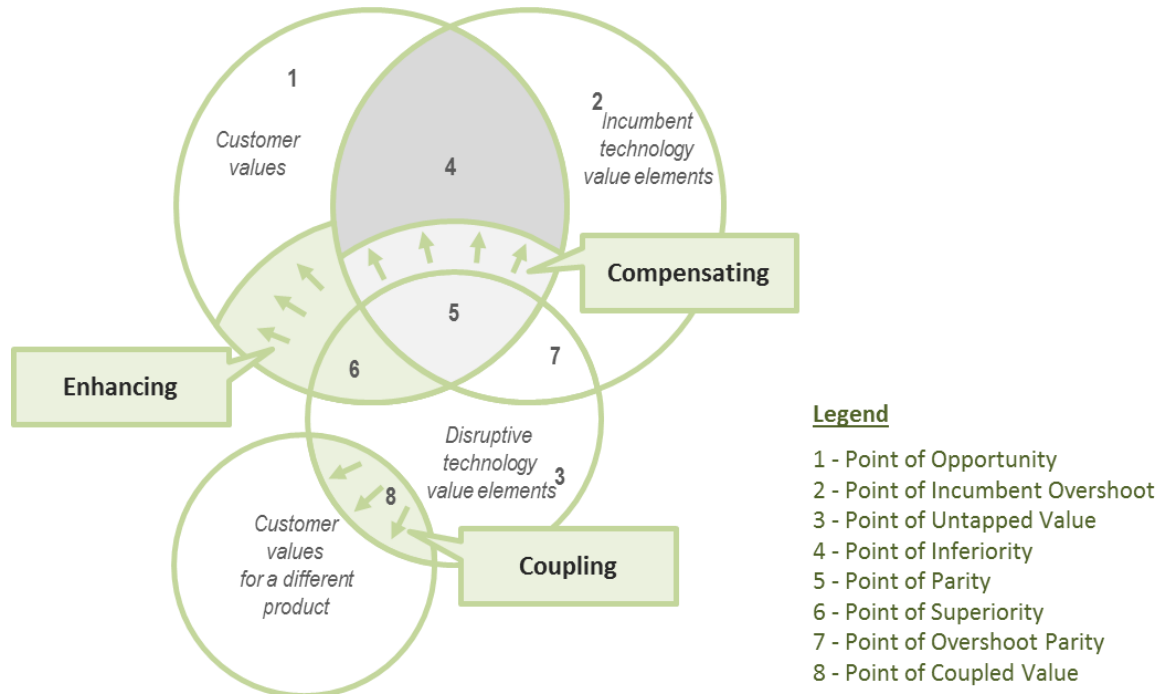


Figure 2: Value proposition reconfiguration diagram

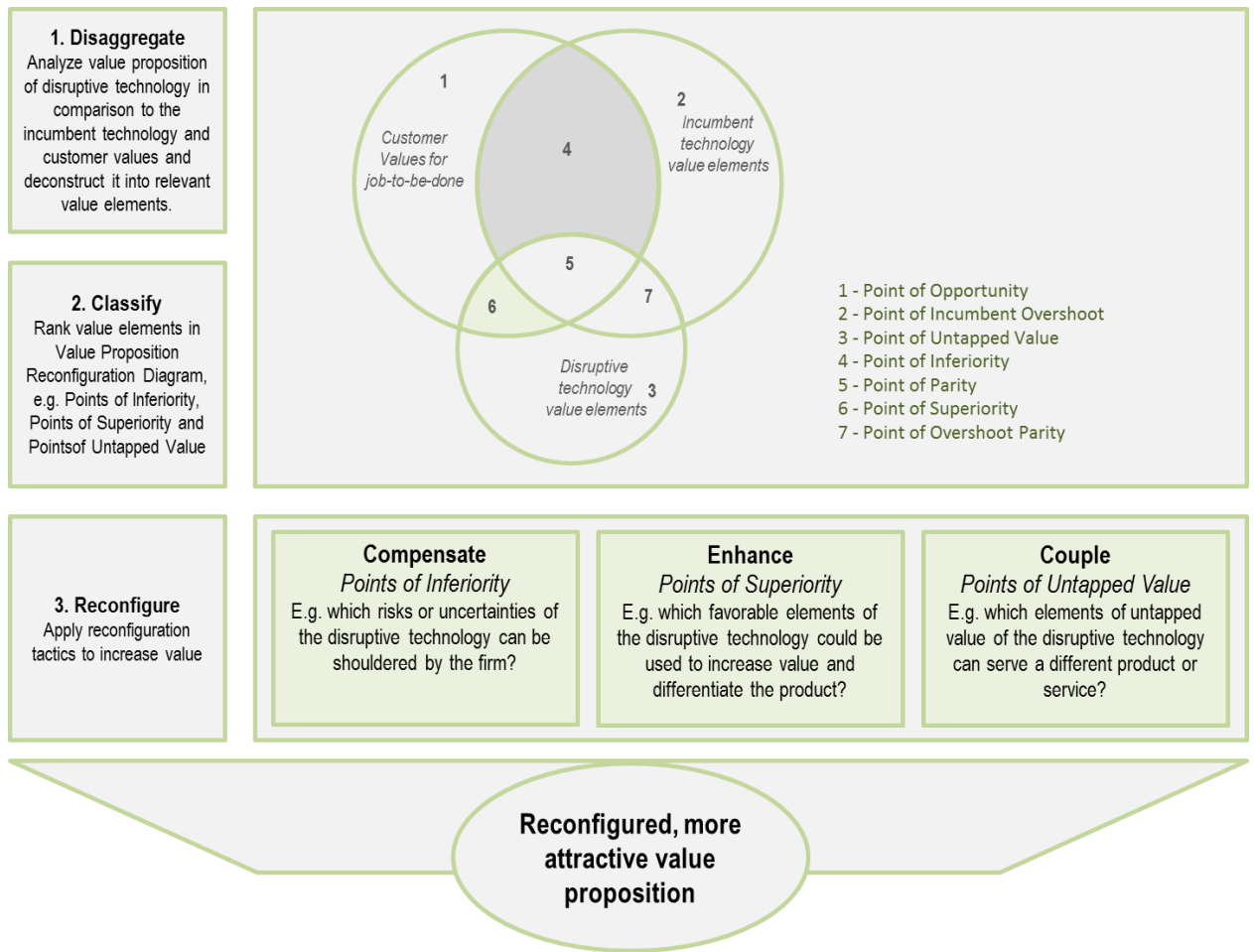


Figure 3: Value proposition reconfiguration steps

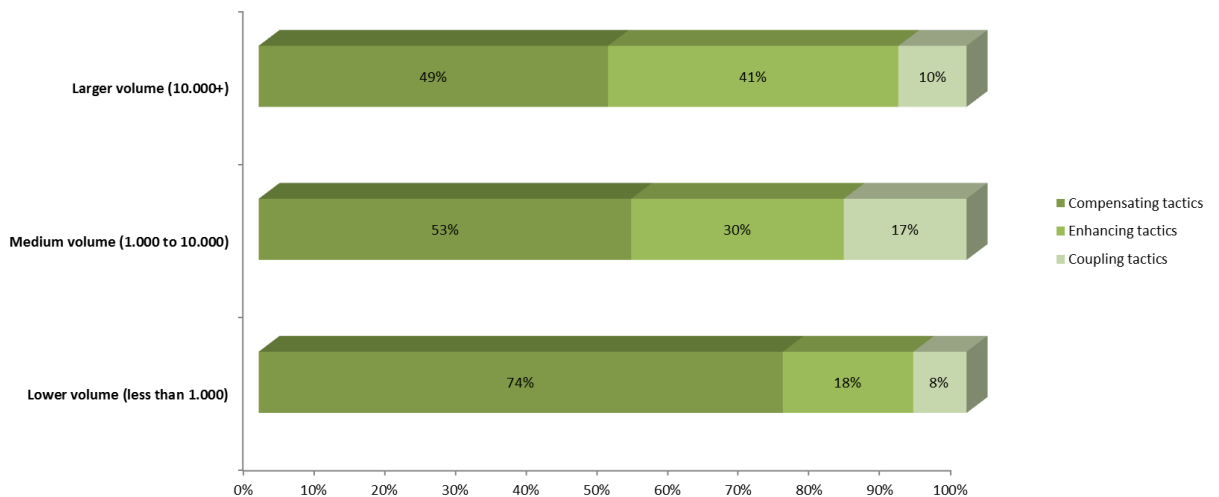


Figure 4: Volume producer categories of EVs in the U.S. and their respective applied reconfiguration tactics (2014)

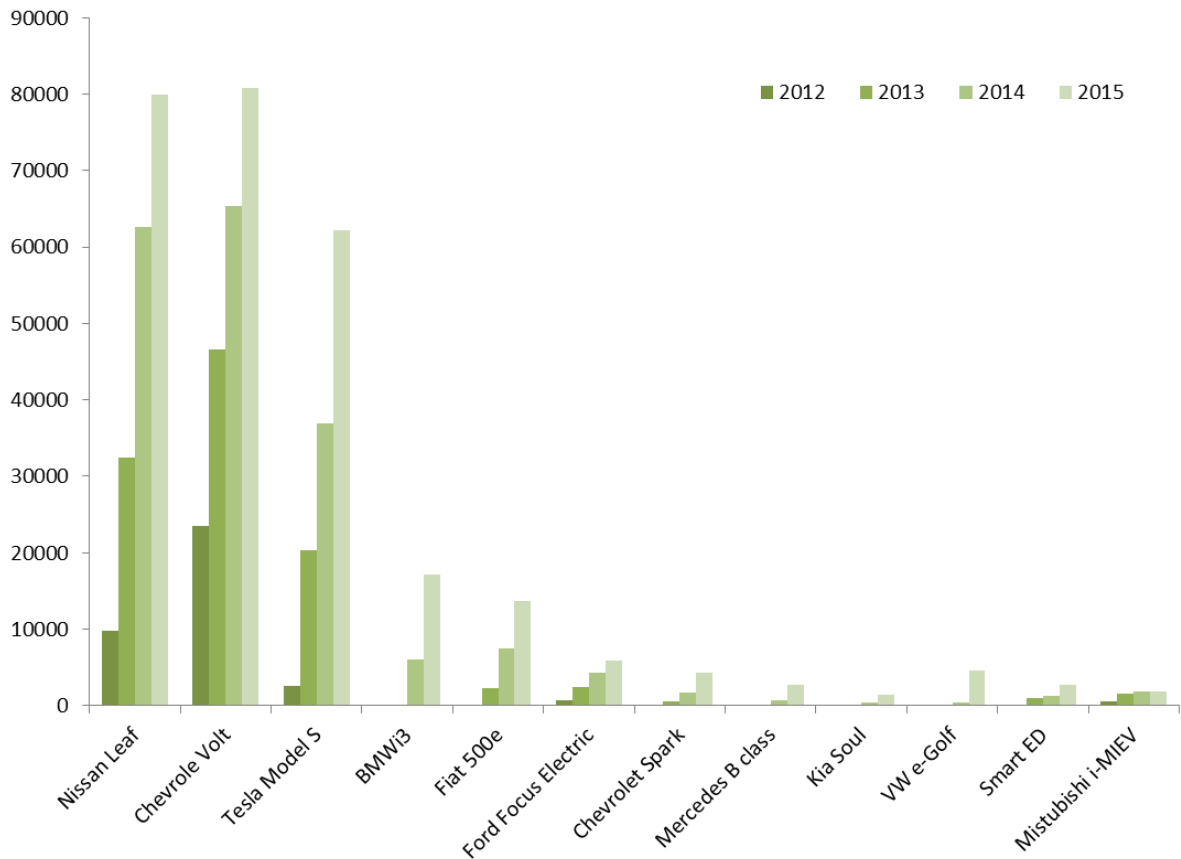


Figure 5: EV sales 2012-2015

Table 1: Qualitative classes of value propositions' value elements

| Class | Description | Example of electric vehicle as potentially disruptive technology |
|--------------------------------|--|---|
| 1 Point of Opportunity | Unsatisfied elements which could provide additional value | <i>Driverless driving</i> |
| 2 Point of Incumbent Overshoot | Elements of the incumbent technology customers do not value | <i>Improved automatic transmission</i> |
| 3 Point of Untapped Value | Elements of the disruptive technology that are not yet exploited | <i>Use of the battery for the electric grid</i> |
| 4 Point of Inferiority | Elements in which the incumbent technology outperforms | <i>Purchase price, driving range, lack of charging infrastructure</i> |
| 5 Point of Parity | Elements in which the performance is equal | <i>Safety</i> |
| 6 Point of Superiority | Elements in which the disruptive technology outperforms | <i>No tailpipe emissions</i> |
| 7 Point of Overshoot Parity | Elements which are equal but customers do not value | <i>Ability to use for mobile advertisement</i> |

Table 2: EV models compared

| Model | Year of introduction | Price starting from | Electric Driving Range in km |
|---|-----------------------------|--|--|
| <i>Reference vehicle</i> | | | |
| Ford Focus with an ICE | 2014 | \$20.000 | 760 km (equivalent to 470 miles) |
| BMW i3 | 2013 (2014 in the US) | €35.500 / \$41.350 | 130 – 160 km (with additional range extender 120 – 150 km extra) |
| Nissan Leaf | 2010 | €30.010 / \$28.980 | 200 km |
| Chevrolet Volt (E-REV) | 2010 | \$34.995 | 40 – 80 km (with range extender 670 km) |
| Ford Focus Electric | 2013 (2012 in the US) | €39.990 / \$35.995 | 120 km |
| Renault Zoe | 2013 | €20.990 (without monthly battery rental) | 210 km |
| Fiat 500e | 2013 | \$31.800 | 140 – 160 km |
| Chevrolet Spark EV | 2013 | \$26.685 | 130 km |
| Mercedes-Benz B Class Electric Drive | 2014 | \$42.375 | 140 km |
| Kia Soul EV | 2014 | €32.995 / \$33.700 | 210 km |
| Volkswagen E-Golf | 2014 | €35.490 / \$35.445 | 190 km |
| Citroen C-Zero | 2010 | €28.990 | 150 km |
| Mitsubishi i-MiEV | 2011 | €19.990 / \$22.995 | 160 km |
| Opel Ampera (E-REV) | 2011 | €39.990 | 40 – 80 km (with range extender 500 km) |
| Smart Electric Drive | 2013 (2011 in the US) | €19.900 (with battery) / \$25.500 | 145 km |
| Volkswagen e-Up | 2014 | €25.520 | 160 km |
| Tesla Model S | 2013 (2012 in the US) | €69.000 / \$69.900 | 370 – 480 km |

Table 3: Compensating, enhancing and coupling tactics

| Dimension | Compensating tactics | Enhancing tactics | Coupling tactics |
|---------------------------------|--|--|---|
| Focus of tactic | <i>Emphasis on points of inferiority</i> | <i>Emphasis on points of superiority</i> | <i>Emphasis on points of untapped value</i> |
| Process | <i>Bring the disruptive technology on par with the incumbent technology by shouldering risks or providing low-key hybrid versions.</i> | <i>Exploit the advantages of the technology for the job to be done. Differentiating the product or service through changes in the value network.</i> | <i>Serve a job to be done that has previously not been served by the incumbent technology. Often experimental in character.</i> |
| Outcome | <i>Performance parity between the incumbent and disruptive technology. Points of inferiority (4) turn into points of parity (5).</i> | <i>Increased value perception by fulfilling values that were so far not satisfied for the job to be done. Points of Superiority (6) extend into Points of Opportunity (1) (link to Blue Ocean)</i> | <i>Adding a so far unrelated customer value, creating coupled value (8), yet possible dilution of clear value proposition.</i> |
| Effect on business model | <i>Little influence on the existing business model causing only moderate changes.</i> | <i>Strong influence on business model causing substantial changes in the value network.</i> | <i>Potentially strongest influence on business model causing a deviation away from the economic logic.</i> |

| | | | |
|-----------------|---|--|---|
| Logic | <i>Required to achieve confidence and trust in disruptive technology of users against incumbent technology.</i> | <i>Necessary to increase perceived value for a larger share of potential customers. Source of differentiation and positioning in the market.</i> | <i>Potential to create additional value for specific use cases. Over time coupling tactics can become more dominant in the value creation process.</i> |
| Examples | <ul style="list-style-type: none"> ▪ <i>Separately renting the battery (reduces price of the car)</i> ▪ <i>Extended warranties (reduces uncertainty of unproven technology)</i> ▪ <i>Guaranteeing fixed residual price (reduces uncertainty about second hand value)</i> ▪ <i>Roadside Assistance (reduces uncertainty about reliability)</i> ▪ <i>Providing fast charging (reduces fear for getting stuck)</i> ▪ <i>Providing conventional exchange cars (reduces fear for not being able to go on holidays)</i> ▪ <i>Dashboard tools</i> ▪ <i>Different drive modes</i> | <ul style="list-style-type: none"> ▪ <i>Providing mobile applications (adds transparency and connectivity which fits the electric character of the car)</i> ▪ <i>Embedding EV in a system of alternative modes of transport (fits the more innovative character of the electric drive train)</i> ▪ <i>Setting up car sharing services (adds value due to increased flexibility; car sharing is more suitable in combination with EVs than with conventional cars due to reduced maintenance requirements and cost effectiveness with increased utilization)</i> ▪ <i>Providing free maintenance (unusual, but possible due to little maintenance required by the technology)</i> ▪ <i>Offering home charging (increases independence due to ability to charge anywhere from the grid)</i> | <ul style="list-style-type: none"> ▪ <i>Collaborating with energy providers and providers of solar systems (allows using the battery of the car for storage of self-generated energy)</i> ▪ <i>Collaborating with home charging station providers (allows autonomy from the grid by connecting the household to the EV battery, beneficial against blackouts)</i> |