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## **DESIGN AND BUSINESS MODEL EXPERIMENTATION**

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### **ABSTRACT**

A chasm currently exists between business and design, which involves transforming strategic business objectives and market opportunities into actionable design criteria. Poor feedback loops from new product development to strategy formulation hinder organizational learning and perpetuate outdated strategies. Leveraging pioneering theories in business management and design quantification this paper proposes a Design & Business Model Experimentation method for including design up-front in business experimentation. Applying a triple-loop iterative approach four levels of organizational capabilities are aligning business objectives with design criteria. The method leverages design in formulation of business strategies, conducting business model experimentation, while constructing a driver - enabler competitive matrix supporting the translation of business model elements into actionable design quality criteria. These in turn inform business plans and design briefs, providing the core criteria for initiating business-focused concept generation. The work contributes to new product development management and addresses the disconnection between business and design.

*Keywords: business strategy, business model, business plan, design brief, conceptualization, exploration, organizational learning*

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## **1 INTRODUCTION**

Top tier corporations have strong innovation cultures that manifest as an imbedded sense of their values, beliefs and vision. They know their mission and their strategies to achieve goals and objectives, enabling them to outperform the S&P500, on average, 3.5 percent over a seventy-year period (Collins and Porras, 1996). These firms understand that continued exploration and exploitation is essential for sustainable progress, thus ensuring a balanced portfolio of incremental and breakthrough products (March, 1991). However, few of these firms challenge their underlying philosophy and business model (Zott, Amit and Massa, 2011). Thus, corporations continue to use their time-proven business models until they begin to fail, only then realizing the need for change and the exploration of new models. In doing so, they may attempt to adopt models from more successful firms, failing to understand these models' unique fit with their competitors' culture, organizational architecture, routines and incentive systems (Johnson, Christensen and Kagermann, 2008). To adapt any new models, nothing short of organizational renewal is required.

Since the new business model is often inconsistent with an existing model, conventional firms typically deal with renewal by setting up new business development departments and establishing new business-units independent or semi-dependent of the corporation (Markides and Charitou, 2004). We propose including business model experimentation in the early business phases of new product development as a means to continuously challenge and examine business model opportunities. Including design in business model experimentation, leverages design's capability to synthesize diverse knowledge, generate novel alternatives and communicate these alternatives effectively in a visual form. Ensuring early input from design additionally has the advantage of increasing the actionability of the generated business models, while providing designers valuable time to explore and incubate design ideas prior to conventional design kickoff.

Currently, the manner in which design is integrating with business provides marginal benefits, resulting in only one percent additional revenues (National Agency for Enterprise and Housing, 2008). Auditing high design performing corporations, as defined by design award reception, shows that these corporations' stocks outperformed their peers by 1 percent and commanded 6.5 percent annually over that of the S&P500. This suggests that design can make a considerable contribution to the value of new products and the overall organization in general (Petersen, 2007, 2009). Furthermore, studies of design brief performance show that briefs with a high content of strategic information outperform briefs with average strategic content by up to 30 percent when it comes to investors' expectation and novelty (Petersen, 2010), suggesting there is a huge opportunity for improved integration of business and design. Our objective is thus to devise a model for effectively translating business strategies into actionable design criteria.

This work is grounded in a systematic approach to business strategy (Afuah, 2004), (Santos, Spector and Heyden 2009), (Kim and Mauborgne, 2004) and (Nielsen, 1989), business model development (Osterwalder and Pigneur, 2010), (Santos, Spector and Heyden 2009) and (Reeves, Love and Tillmanns, 2012), design quantification (Petersen 2009) and research in translating business plans into design conceptualization though business plan criteria (Heebøll, 2008) and (Petersen and Heebøll, 2011), portfolio management (Petersen and Steinert, 2011), design briefs (Petersen, 2010) and concept evaluation and selection (Petersen and Joo, 2012). The resulting Design & Business Model Experimentation method is inspired by literature review, crowdsourced challenges, brainstorming sessions and expert interviews. The model integrates business and design from the business strategy formulation, business model experimentation, business plan and design brief formulation to concept synthesis initiation.

## **2 METHOD DEVELOPMENT**

The procedure for developing the method consisted of three main phases: Framing, Design and Assessment and was conducted in the summer and fall of 2012.

### **2.1 Framing**

The project applied Design Thinking, characterized by up front definition of perspective, user-centered approach, predefined decision-criteria, rapid design and prototyping cycles, concluding with a learning feedback-loop. Following is description of the procedure.

### 2.1.1 Framing of Business Model – Design framework

Design research and consulting highlight the communication gap between business, design and organizational capacities to the detriment of planning and executing new product development (Petersen 2011), hence, these three elements constituted our starting point. Using Afuah’s framing of business strategy, we formulated a translation from Osterwalder’s nine business model elements: Customers, Customer relationship, Delivery channels, Value proposition, Activities, Resources, Partners, Cost Structure and Revenue stream, to Petersen’s Design Quality Criteria, involving Afuah’s description of organizational capabilities. The Design Quality Criteria (Petersen 2009) are nine criteria: Philosophy, Structure, Innovation, Social/Human, Environmental, Viability, Process, Function and Expression, found to be key success metrics for design briefing, design evaluation and design award reception, for consumer products. These are important for translating business strategy and models into actionable design briefs. See Figure 1.

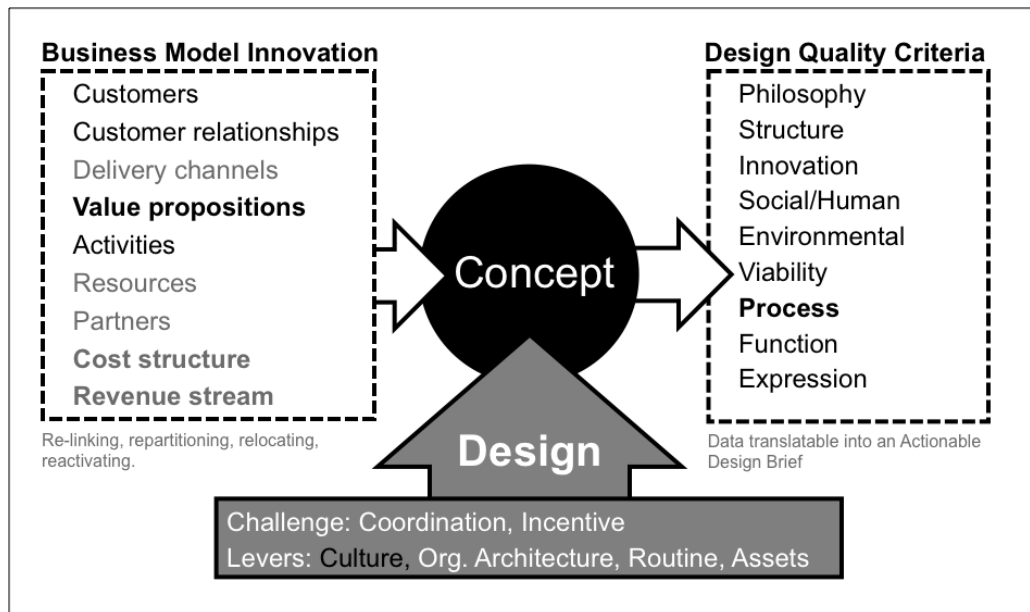


Figure 1. Coordination of Business Model Generation and Design Briefing driven by organizational capabilities. Applying the organizations capabilities, business model elements are conceptualized and formulated as Design Quality Criteria to inform design conceptualization. Bold statements are top priority criteria; black statements are criteria with a high level of design contribution.

### 2.1.2 Crowdsourcing

As an approach to ensure actionability of business model experimentation, we propose including design in this stage of the business process. With the aim of gaining insight into the potential contributions design can provide, the question was crowdsourced as a challenge to the design community using the formulation: “How can designers best contribute to the creation of Business Models?” and applying the Six Step Co-creation Cycle (Petersen, Santiago, Aitamurto, Spencer and Joo, 2011) and (Petersen, 2013). Crowdsourcing leverages “Wisdom of Crowds,” where the fundamental idea is that the collective intelligence of a crowd, when no interaction takes place among its members, will converge on an answer to a challenge that is more accurate than any of its individual members (Surowiecki, 2005). The challenge received fifty-five comments from nine design communities on LinkedIn and findings were shared in an article on The Huffington Post (Petersen and Brunswicker, 2012). The insights were:

- Designers' visual communication, cross-pollination and lateral thinking make them ideal facilitators of business model creation. A designers' unique ability to visualize concrete and abstract ideas enables them to clarify concepts as opposed to merely simplifying them. They can synthesize concepts from diverse information and propose concepts for team discussion. In some cases, they may even be able to assist in prototyping business models before substantial time and money are invested.
- Design, being the hub of new product development, offers the opportunity to ensure alignment

of stakeholder interest through the process from business model to final delivery while securing design cohesiveness.

- Product positioning and expression of brand values is an area where design experts have extensive knowledge and experience. Design can ensure that brand considerations are included in the business model and expressed cohesively across all touch-points of the user experience.
- We also learned that designers believe they can contribute to four of the nine business canvas elements (customer understanding, customer relationship building, creation of value proposition and design activities). The engagement level from the design community was somewhat above average, suggesting that the design community has some interest and familiarity with the concept of business models.

### **2.1.3 Literature review**

Broadening our insight into business literature, Google Scholar was used to search for relevant and inspiring articles for method development, using the search strings, "Business Model Innovation" AND "New Ventures", 'Organizational AND design', "Strategic renewal" AND "business model", "Business model innovation" AND experimentation' and "Organization\*" AND "experimentation". Reviewing the abstracts from the first fifty articles for each search-string, eighty-four articles were deemed relevant and the thirty most promising were analyzed, providing the following six insights:

1. Definitions of Business strategy, Business Model and Business Model Innovation (Santos, Spector and Heyden 2009), which were selected as the basis for a systematic approach for method development:
  - Business strategy: (a) What is the offer, (b) Who are the customers, and (c) How is the offer created, produced and delivered to the customers?
  - Business Model: (a) Configuration of activities and (b) of the organizational units, (c) linkage within and outside the firm and (d) designed to create value in a specific product/market set.
  - Business Model Innovation: (a) Is a reconfiguration of activities in the existing business model of a firm (b) that is new to the product/service market in which the firm competes.
2. The Right Strategy Style for Your Environment, aligning business strategy with environment (Reeves, Love and Tillmanns, 2012), which was selected as an approach for aligning market drivers and technology/execution enablers with strategy style. The two-by-two matrix divides the environment into low/high malleability and high/low predictability.
3. Business Model Innovation's dependency of alignment with the organization capabilities (Santos, Spector and Heyden 2009), which was selected as an approach for framing risk and level of imitability. Seven business model innovation cases (five successful and two failed) illustrate how aligning organizational capabilities (assets, procedures, organizational architecture and culture) are critical for a successful outcome.
4. What are the most important elements of business models? Johnson, Christensen and Kagermann (2008), establishes the value proposition, cost structure, revenue generation and process as the most important element for business model success, which was then applied as initial guides for business model experimentation.
5. Blue Ocean Strategy Canvas (Kim and Mauborgne, 2004), which provide a visualization method for how a corporation's offerings can be differentiated from that of the competition by eliminating, decreasing or increasing of performance parameters (Red Ocean Strategy) or creating novel parameters (Blue Ocean Strategy). The approach was selected for addressing competitors' strategy by fine-tuning planning (business model elements) and execution (Design Quality Criteria).
6. Business Models are more generic than business strategies and to be successful these have to be tied closely with new product development (Teece, 2010), which confirmed the importance of closely linking business model experimentation with design execution.

## **2.2 Design**

Over the course of three months a "work-in-progress" PowerPoint presentation captured the knowledge, insights and ideas gathered from ongoing literature review and brainstorming sessions. Twenty-six experts in marketing, design, engineering, design research, new ventures, business

modeling, economics, financing, statistics, design and business consulting, education, open innovation and sustainability were invited to participate in developing the model. The outcome was:

1. A four-step process, including the phases: (I) Business Strategy, (II) Business Model Canvas, (III) Business Plan & Design Brief and (IV) Concept synthesis. See figure 2.
2. Driver – enabler matrix, prioritizing connections between business model experimentation and design execution. See Figure 4.
3. Organization - Design Quality Criteria enabler matrix, showing required organizational capabilities for translating business model into design action. See Figure 5.
4. Design Synthesis Matrix, See Figure 6.

## **2.3 Assessment**

Assessment of the Design & Business model Experimentation method by potential users is completed applying the Six Step Co-creation Cycle crowdsourcing approach. See Figure 2.

### **2.3.1 Crowdsourced reviews**

Reducing various relationship-based-biases in evaluations of the developed model, a “Business Model Lab” LinkedIn group was formed to reach out to second order professional connections and beyond. Professionals in product development were invited to join, forty did and a dozen offered to review an online presentation and provide feedback on coherence, comprehensiveness and usefulness in a twenty to thirty minute open-ended, semi-structured Skype or telephone interview. The model was well received and accepted with minor modifications to the order of the slides and graphics for increased clarity.

### **2.3.2 Gauging relevance**

Most new models will never be or are slow to be implemented in practice (Tucker, 2009). Crowdsourcing can facilitate adoptions, as was the case with development and launch of the “Business Model Generation” approach. To gauge the interest and ability of the design community to participate in business modeling, the project was initiated with a crowdsourcing challenge and followed up by two Huffington Post articles (Petersen and Brunswicker, 2012) and (Petersen and Stevels, 2012). Challenge engagement (number of comments) and article dissemination (number of forwarded articles) were compared with that of fifteen evenly distributed incremental to breakthrough challenges. The number of comments to the challenge ranked as 50th percentile and the resulting forwarded articles as 55th percentile. This suggests that business modeling is new to the design community and commands a somewhat above average interest.

## **2.4 Description of model**

The Design & Business Model Experimentation method consists of four steps: (I) Formulation of a Business Strategy, (II) Business Model Experimentation, (III) Formulation of Business Plan and Design Brief and (IV) Conceptualization, which step-by-step application is described in the following. The first iteration focuses on concepts, second on design, third on engineering, fourth on simulation and the fifth on user experience. See right column in Figure 2. Each iteration cycle reexamines the assumptions and instructions in all steps, moving from abstract to concrete.

### **2.4.1 Formulation of a Business Strategy (I)**

A business strategy describes how coordinating external opportunities with internal capabilities can create value. To map external market position, an Environmental Strategy is applied. The matrix map low/high market malleability with high/low predictability. In the first quadrant, with low malleability - high predictability, a Classic strategy is recommended. In the second quadrant, with high malleability - high predictability, a Visionary strategy is recommended. In the third quadrant, with high malleability and low predictability, a Shaping strategy is recommended. Finally, in the fourth quadrant, with low malleability and high unpredictability, an Adaption strategy is recommended. See Figure 3.

Having determined the corporation’s strategic environment a product innovation strategy is selected using a Product Search matrix, see Figure 3. The horizontal axis depicts drivers as three levels of need understanding: Recognized needs, clarifying needs and realizing needs, while the vertical axis depicts enablers as three levels of execution approach: Applying current technology, applying new technology and developing new technology. A classic strategy calls for incremental innovation, the lower left quadrant in the Product Search matrix, while a visionary strategy calls for breakthrough innovation,

the upper right corner. A shaping strategy calls for innovation along market needs (market pull strategy), while an adaptive strategy calls for innovation along new technology development (technology push). See Figure 3.

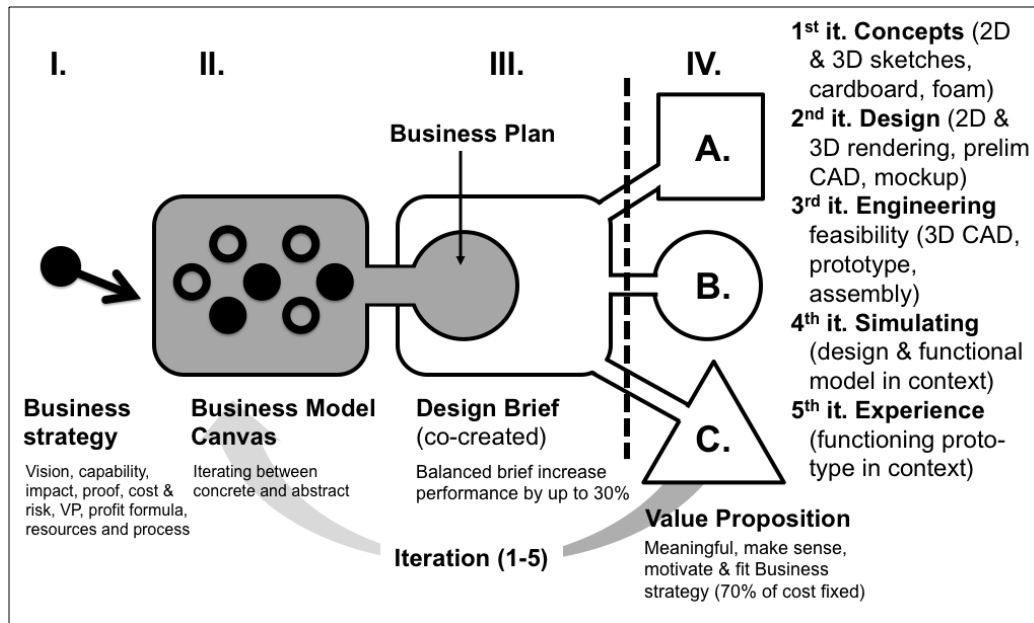


Figure 2. Design & Business Model Experimentation method

The appropriate Environmental Strategy – Innovation Strategy translation now forms the foundation for the Business Strategy formulation, customarily describing: Vision, capabilities, impact, proof, cost and risk, and how these are translated into a value proposition, profit formula, required resources and activities required for execution.

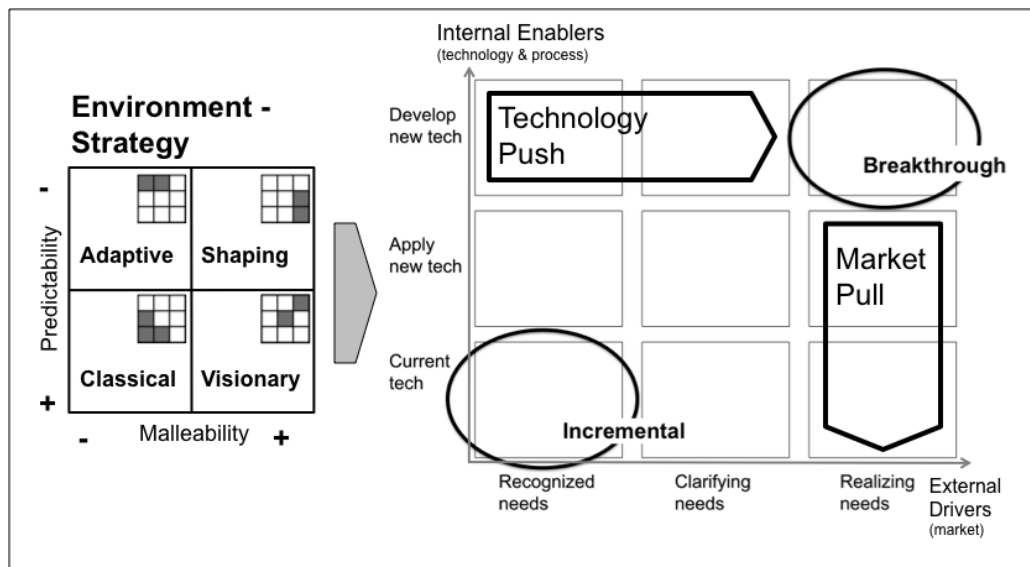


Figure 3. Aligning Innovation level to Environment Strategy

#### 2.4.2 Design & Business Model Experimentation method (II)

The Business Strategy now informs experimentation with the business model, applying the Business Model Canvas. See Figure 4. In multi-functional brainstorming sessions, new business models were generated. The existing business model and alternative business models provided the kernel for experimentation and were identified inside, as well as, outside the current business area. Applying the Business Model Canvas it is important to be aware that it does not include the consideration of competitive forces (Porter, 2008), development of dynamic capabilities (Tece, 2009) and ecosystem complementors (Amin and Zott, 2011), which must be considered separately. When a promising

business model seems to have been generated, it is examined for four factors: (a) linking drivers and enablers, (b) benchmarking driver – enabler linkage with that of competitors, (c) coordinating frontend with backend and applying the Blue Ocean Strategy (Eliminate - Raise – Reduce – Create), see Figure 4, (d) aligning business model execution with the organization’s capabilities and (e) initiating conceptualization based on key criteria.

- a. Since early experimentation is conducted, initial linking drivers and enablers are based on an experienced based and intuitive evaluation, then refined in the following iterations. Pareto’s “80/20 Rule” (Pareto and Alfred 1971) is applied for prioritization and the top twenty percent most important, as well as, the bottom twenty percent least important connections are emphasized in the “Business Canvas driver – Design Quality Criteria enabler matrix.” See Figure 4.
- b. Comparing the business model translation into action via driver – enabler linkage, to that of the most important competitor, the competitor’s most important driver – enabler connection is assigned to the matrix. See Figure 4.
- c. Comparing the corporation’s most important driver – enabler connections to that of the most important connections of the competitor then form the basis for eliminating, reducing, increasing or creating new connections for first the frontend, followed by establishing the supporting connections for the backend. The frontend of the canvas contains the elements which are perceived by the customers, while the backend are the elements supporting the creation, delivery and capture of value. See Figure 4.
- d. Following three or more business model experimentations, a map is produced, connecting the enablers to the organization’s supporting capabilities within: assets, routines, organizational architecture and culture. This works as a first evaluation of the risk, real and perceived, associated with the organization – driver – enabler alignment and the level of imitability, hence long term sustainability. See Figure 5.

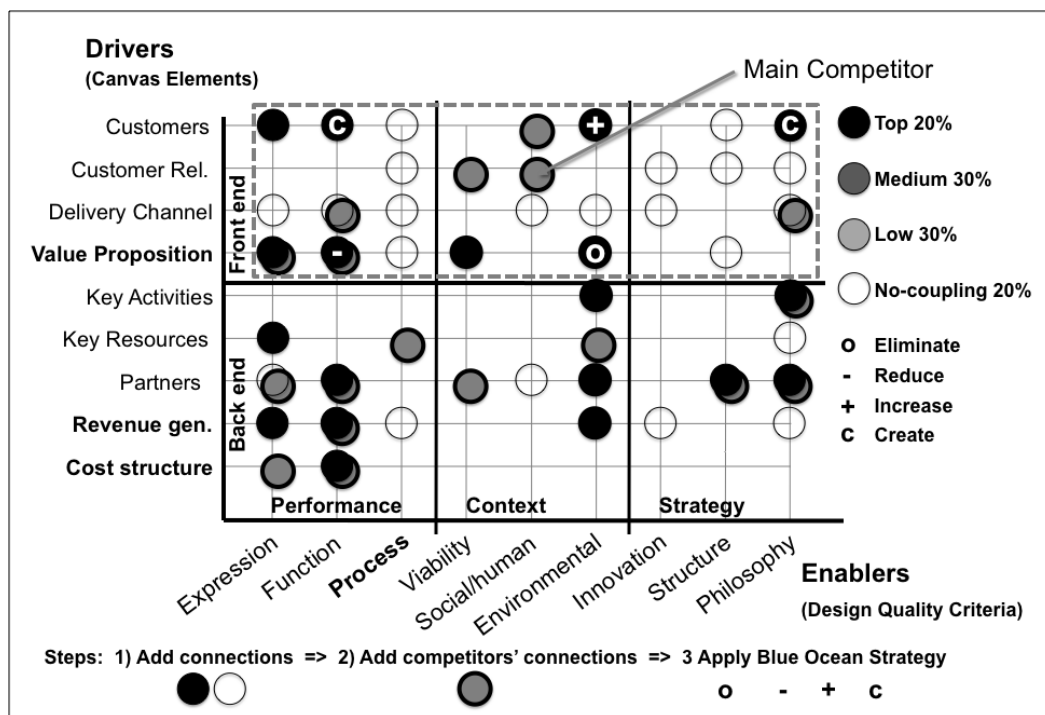


Figure 4. Business Canvas Driver – Design Quality Criteria enabler matrix, comparing the corporation’s connection of plan to action with that of its main competitor. First, the corporation’s top (black dots) and bottom (white dots) connections are assigned; represent the 20% most important and 20% least important connections. Second, the main competitors top 20% most important connections (gray) are included. Third, the Blue Ocean Strategy of eliminating, reducing, increasing or creating connections is applied. First along the frontend, then the backend Business Canvas’ elements, visualizing the created competitive advantage

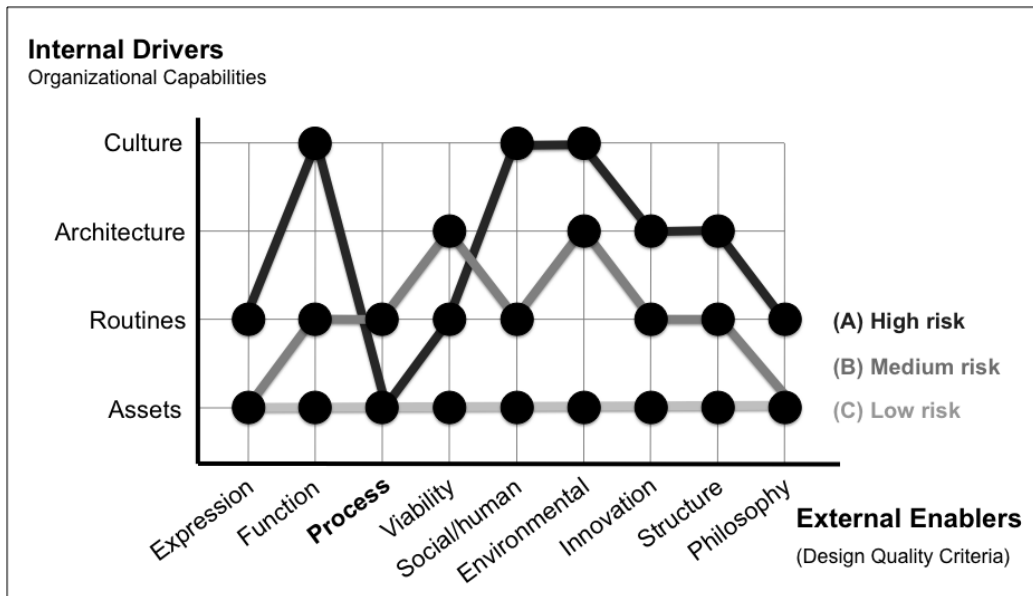


Figure 5. Internal Driver - External Enablers matrix, connecting organizational capabilities to design execution using Design Quality Criteria.

- e. As a final point, the core Design Quality Criteria for the most important drivers - enablers form the basis for initiation of conceptualization, in the example used, the creation of new features and increase of expression. Including the most important business model - design criteria in an Ideation Map from the start aids the designers in prioritizing their initial inspirational parameters. See Figure 6. The prime importance of the design concept is capturing and communicating the value proposition. All participants in the framing, design and assessment of the model stressed the importance of a strong value proposition for any successful business opportunity. Also, there was agreement that a value proposition could only be effectively evaluated when conceptualized into an artifact with which the development team and users might interact and evaluate.

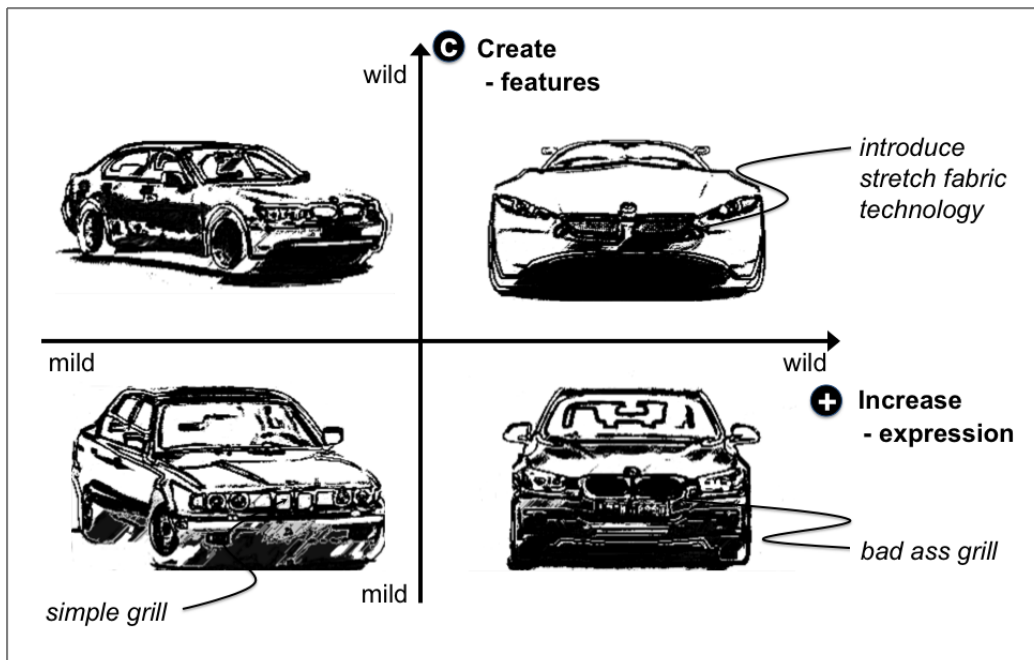


Figure 6. Ideation Map, showing, from wild-to-mild, the key Design Quality Criteria solution space assisting in focusing the initial ideation



### 3 SUMMARY AND CONCLUSION

The proposed Design & Business Model Experimentation method bridges the gap between business strategy and design conceptualization, by outlining a four step process which includes design in strategy formulation, business model experimentation and the translation of business model drivers into actionable Design Quality Criteria enablers. Including business strategy, organizational capability and design considerations in business model experimentation increases actionability. The triple-loop iterative nature of the process facilitates alignment of business strategy, model, plan, brief and design execution as these are being defined in parallel adding to the effectiveness of execution.

The contribution to business and design research is a guideline on how to include design from the early business phases together with an assessment, using crowdsourcing, to evaluate design's potential core contribution. As the Design Quality Criteria constitutes an important part of the foundation for the methodology, the model is limited to use in freestanding business units for planning and execution of products with a high degree of user interaction, such as consumer, automotive, medical and office furniture.

The model could benefit from future research into applicability in other business areas as well as integration up stream with corporate strategy for multi-business-unit organizations. Finally, the research into how the model could be adjusted to address the business and product development challenges of entrepreneurial start-ups, where the organization is built concurrently with the development of first generation products, would significantly increase the models potential impact.

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