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THE BUSINESS MODEL, THE SILENT RULER OF DESIGN LOGIC

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ABSTRACT

In a traditional linear business model (LBM), focus is on maximization of a product's value at point of sale (POS) and devaluation to obsolescence, creating a path dependency towards faster replacement cycles to retain sales volumes. Resulting in increasing volumes of waste and pollution from products being disposed of, with low incentives or possibilities for recovery by e.g. reuse and remanufacturing. Based on a case study of a bicycle manufacturing SME, using an interventionist research setting, we have found that a business model change affects the existing design logic quite effectively. It seems that the business model is conditioning the decision logic of senior management and has to be addressed first in firms that want to make significant eco-sustainability improvements.

INTRODUCTION

More and more firms consider it crucial to become eco-sustainable for their business (Kiron, 2012). This is highly challenging as most companies strive to maximize profits that for manufacturing firms running linear business models (LBM) arises from margins between price and cost, times volume sold. This encourages cost minimization and volume maximization and to willingly making own products obsolete to maintain sales on saturated markets. However, Product-Service Systems (PSS) combined with closed material loops through e.g. reuse, and remanufacturing is considered to profitably reduce resource consumption up to 80% (Pearce, 2009; Nasr, 2011; Nasr & Thurston, 2006), but requires a business and design logic with focus on product's lifecycle profit maximizing instead of POS. Given the daily efforts in industry to reduce cost and improve competitiveness and profits, why is not these profitable sustainability improvements rapidly introduced? We set out to test the idea that a firm's business model "rules" its management's decision logic. A more eco-sustainable business model must then precede more sustainable design logic to obviate any conflict between sustainability and profit. When it does, the business model will support the more sustainable design logic regardless of senior management's sustainability engagement.

MATERIALS

Already in 1932 Bernard London argued for the importance to plan for short product lives to get the industry back on feet from the recession (London, 1932). This was successfully implemented in industry by yearly facelifts and with a design logic "instilling in the buyer the

desire to own something a little newer, a little better, a little sooner than is necessary" (Adamson, 2005:129). And since then well implemented in today's product-design; often pristine, fragile and inviolable (Cooper, 2010), resulting in functional and aesthetical obsolescence or breakdowns with few possibilities for profitable product recovery, sometimes even prevented by the OEM (Pearce, 2009). LBMs together with planned obsolescence have created a path dependency towards faster replacement cycles, once in harmony between industry and society but now leading towards unsustainability with eco efficiency efforts being more than offset by increased product volumes and faster product life- cycles (Stahel, 2007).

A business model (BM) describe how a firm create, deliver and capture value (Osterwalder, 2004). All firms have a BM but the vast majority does not articulate it and lack a process for rejuvenating it (Chesbrough, 2007). Over time, as the BM shows it's strengths, it also becomes an inhibitor for new BM's (Johnson, 2010). The most common BM among manufacturing firms is the linear BM were the legal right over a product is transferred at POS to the buyer, who also will inherit all future risks; esthetical, functional, operational, and financial with low economical incentive's and several barriers for product recovery (King and Burgess, 2005). Guiltinan, (2009) notes that, design and engineering has made progress in building a sustainable culture. But at the executive management level however, eco sustainability initiatives purposely does not include extending product durability for profitability and employment reasons (Sonntag, 2000 in Guiltinan, 2009).

We draw from Guiltinan's (2009) model of decisions and influences in our assumption of a master and servant role between a firm's business model and the design and engineering practices.

METHOD

A research project was set up with an Original Equipment Manufacturer (OEM) who was open to introduce a PSS for a new product segment and who didn't have any articulated eco-sustainability vision, strategy or ambition. The study was designed as a longitudinal single case intervention research study (Lukka, 2006), with an insider/outsider approach (Bartunek and Louis, 1996). The authors helped the OEM implementing a CBM during a twelve months period, working closely with the owners along the principles of customer development (Blank and Dorf, 2012), and with a user centred approach. Another researcher followed as an observer, collecting data about the developments and perceived challenges. Data was collected with the aim of observing and understanding how the managers of the firm reasoned about bicycle design and why, and how that reasoning changed when the CBM evolved and was implemented. An initial interview was held with the two owners/managers representing their uninfluenced design logic. Then followed the collaborative project phase with concept generation of a CBM, design of the PSS with service-touch points, and design of the service carrier optimized for product recovery over three use cycles, one year each. A final interview was held at the end of the project to collect data on if, how and why the managers design logic had changed. Recordings of all meetings and interviews were used to validate the field notes. For testing our assumption of the master /slave relationship, the main data to analyse was from the initial and last interview in the project.

RESULTS

Unicykel AB (UC), a small Swedish bicycle B2C manufacturer, design and produce bicycles under the brand Nishiki. UC's core values is to provide premium, stylish and sporty bicycles, pricing from € 500 to € 5000. In 2011 the two owners/managers wanted to develop an electric assisted bicycle, a fast growing market in the world that also had started to grow in Sweden. But UC had hesitated due to high cost for a product with their premium requirements (approx. 2500€). The authors of this article approached the two owners of UC and proposed a concept for a CBM with a PSS where UC should keep ownership over the bicycle and provide mobility through a subscription. UC was initially very hesitant to the proposal due to achieved financial risks and possible negative effects in their value chain. But after some considerations they saw a potential that a CBM could be a way for UC to bridge the gap for customers with high up front cost and perceived high risk of buying a technically advanced, relatively unproven technology. Remanufacturing was then used as a key enabler to decrease costs without lowering quality. But this was something completely new for UC and their value chain, and challenging for the owners as well as for their subcontractors.

After the collaboration period where the CBM and PSS was developed in parallel with continuous iterations with potential customers, a complete concept for a CBM with PSS was launched in a first prototype series with a set of six pilot customers volunteered to a full-priced service subscription. The test pilots were carefully chosen from a customer segment of people commuting by car or public transport and for which a manual bicycle was considered undesirable. After some months of testing the owner-designer had now embraced the logic of a CBM and started the design of a production version for the electric bike that would be used for high-volume subscriptions.

DISCUSSION

In the previous business decision logic focus was on achieving premium quality balancing between component price/functionality at a customer target price at POS successfully implemented in a design logic with e.g. own frame design, with much care of colour and surface finish, hand built rims and use of disc brakes on all models. The altered business logic achieved by introducing the CBM resulted in a change of focus from item price towards choices of components, functions with a potential to minimize wear and life cycle cost for the OEM. Examples were to choose drum/roller brakes with minimal service need, a protective textile cover for the frame to prevent scratches and minimized need for repainting in the reuse and remanufacturing stage. The tires were chosen with the best available flat tire protection technology as flat tires dramatically could drive service cost, which is included in the subscription.

There are clear signs that the design logic at UC changed with the introduction of the circular business model towards focus on prolonged product life and maximum lifetime profit. Subsystem costs became of less importance if prolonging the lifetime of the bike and/or could be reused many times e.g. electrical motor, frame etc. Such a view rarely gets support in a linear BM as it contradicts mainstream economic thinking (Stahel, 2007). An enabler for altering the design logic was when the design manager could simulate the product's lifetime profit in a conceptual phase of the PSS design. But CBM's with PSS's doesn't automatically lead to eco sustainability improvements (Tukker, 2004) and we see a need for further research



about methods and practical applicable tools for simulation and optimization of possible eco-sustainability effects in PSS design for circular business models.

CONCLUSIONS

Designers and engineers have the potential to create products with a higher overall eco-sustainability performance, but if not aligned with how the firm's senior management think about profit and growth, they will not get through in the decision process. Therefore, we see it necessary to address the business model first in firms that want to make significant eco-sustainability improvements, so that profitability and sustainability can go hand in hand.

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