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TARGET COSTING AS A STRATEGIC TOOL TO COMMERCIALIZE THE PRODUCT AND SERVICE INNOVATION

CBS MARITIME

COPENHAGEN BUSINESS SCHOOL
DEPARTMENT OF OPERATIONS MANAGEMENT

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HANDELSHØJSKOLEN

Blue INNOship

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4 EXECUTIVE SUMMARY

WHAT IS THE ISSUE?

Innovation is an important key to success in today's competitive marketplace. Firms therefore have strived hard to innovate and stay ahead. However, they have to face the brutal fact that firms often fail to obtain the commercial success of innovation.

WHY IS IT IMPORTANT?

With keen international competition and accelerating pace of technology change, the ability to introduce innovations into the market and capture the profits generated by an innovation is of strategic importance. It can put a firm at a competitive advantage and build a firm's sustainable financial benefits.

WHAT CAN BE DONE?

The implementation of target costing will increase the odds of commercial success of an innovation. It aims at fulfilling the economic potential of an innovation by focusing on the market and customers during the design and price setting stages. This price will, on one hand, impose the cost-reduction target in the organization. On the other hand, it can be a driving force for improving the cost-effective design and internal operations.

The project partners reserve the right to update or modify the report.

Today, innovation of product and service is often seen as a major driver of competitive advantage, which could help an innovator dominate the current market or develop new markets (Salamenkaita and Salo, 2002; Datta *et al.*, 2013). It is also an efficient way to overcome the price pressure from emerging markets, which offer similar products or services at the lower prices.

Firms have spent a significant share of time and expense in designing and building products. Yet, the commercial success rate of innovation remains disappointingly low. It shows that 72% of innovations fail to meet their financial targets or fail entirely (Ramanujam and Tacke, 2016). Furthermore, innovation has become an increasingly essential factor of globalization (Datta *et al.*, 2013; Hamel and Getz, 2004). Such pressure has become more pressing as the innovation and technology change are very likely to accelerate further. Thus, the ability to introduce innovations into the market as profitable products or services has taken on an even more central role in building a firm's competitiveness.

Attempts have been made to explain why innovating firms often fail to obtain significant economic returns from an innovation. It could be that engineering-driven companies harbour the mistaken illusion that developing new products which meet customer needs will ensure fabulous success (Teece, 1986). It may also occur due to inefficient business model or organizational structure. In addition, innovators often lament the fact that commercializing innovation is crucial but they lack of commercial skills or experience to fulfill the true potential of an innovation. Among these incompetencies, one of the key challenges is how to set the price and manage the cost for the product or service (McKinsey, 2010). Cost-plus pricing is the most popular pricing strategy,

where price setting is often the last step in the process of innovation. However, this approach results in limited consideration of market and customer and thus a low level of confidence in the innovation profitability.

To ensure the innovation success, a new paradigm is needed. It requires firms to put customer demand and willingness to pay in the driver seat when designing the product or service (Ramanujam and Tacke, 2016). This perspective helps to force an innovative design with the full awareness of market forces and economic restrictions. Then companies can stop hoping to succeed, and start knowing that they will (Ramanujam and Tacke, 2016).

This study aims to forge strong links between product/service designs in the engineering arena with innovation commercialization. We focus on the key research question: how to design the product and service around the price? To achieve this, target costing is offered as a strategic tool to bridge the knowledge gap between engineering and business strategy.

A theoretical framework is suggested in Section 2, which discusses how to ensure the commercial success of an innovation from a business model perspective. Section 3 explains the target costing in details, followed by the discussion on how can target

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costing facilitate the product and service development in the marine equipment manufacturing industry in Section 4. Conclusions are offered in Section 5 with implications for industry practitioners in general and for marine equipment manufacturing industry in particular.



Source: Scanpix / Iris

2 A PARADIGM SHIFT

To design the product and service around the price, it is more than just put a price tag. It requires a more holistic view across the entire business activities. Especially in today’s competitive environment, the holistic approach has become the most effective way to anticipate market changes, enable rapid adjustment and build sustainable financial benefits.

The Business Model Canvas (BMC) is therefore introduced to provide a view of a business’ key activities. The Canvas has nine elements as shown in Figure 1, which can be further aggregated into four blocks, namely Value Creation, Value Proposition, Value Delivery and Value Capture. Value Creation refers to key resources, key partners, and key

activities that firms need to deliver various Value Propositions, which are offered to customers given varied customer relationships, customer segments and channels in the Value Delivery. The cost structure of Value Propositions and their impacts on revenue streams are identified in the Value Capture.

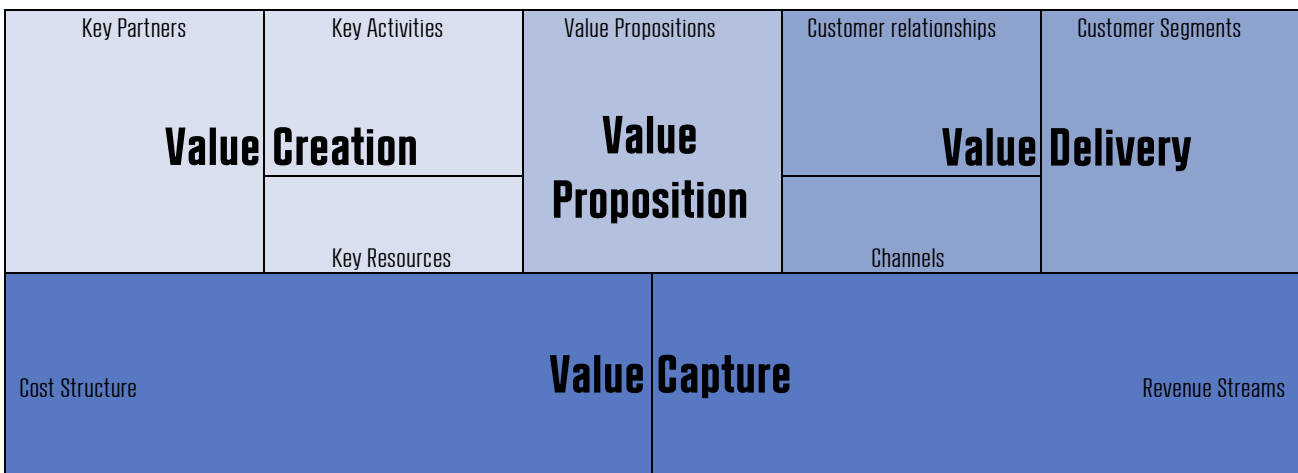


Figure 1 Business Model Canvas

Source: authors’ elaboration based on Osterwalder and Pigneur (2009)

The current practice can be presented within this framework (Figure 2), which follows the design-build-delivery process. When there is an innovative idea, firm first starts with Value Creation in terms of product or service development. The designed product or service will, on one hand form the basis of Value

Proposition and the subsequent Value Delivery. On the other hand, it determines the selling price of a product or service by simply adding a profit margin onto the overall cost. The price then becomes a dominant element of the Value Proposition.

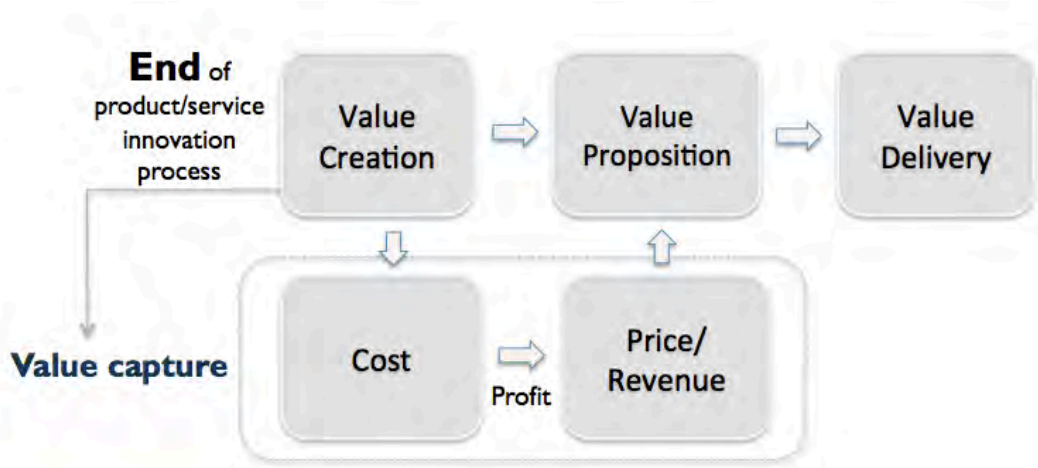


Figure 2 Bottom-up business model

Source: authors' own elaboration

This is a typical bottom-up approach, where cost and price are often considered at the end of the innovation process. It is worth noting, however, this approach has certain limitations. First, firms underestimate the importance of commercialization when turning their technology know-how into a viable business. The majority of total cost is determined by the engineering design process, and that cost will be used to set the price. Jumping into the unknown whether customer will buy your innovation at given price can be really unnerving. Second, this approach is product-centric and heavily relies on the internal factors within the organization. The consideration of exogenous factors, such as customer's willingness to pay, unfortunately falls far short of expectation. But in fact, these external factors often govern an

innovator's ability to capture the profits generated by an innovation (IMA, 1994).

On the contrary, the top-down approach starts with market research and customer insights and then proceeds to product/service design around a clear pricing strategy. Cost is set by subtracting the required profit margin from the price. In this way, cost is considered as an input instead of an output to the design process. There is also a recursive process between the Value Creation and the Value Capture, meaning that design process will recur until achieving the allowable cost. This can help firm significantly reduce investment in innovation with little or no chance of financial success (Datta *et al.*, 2013).

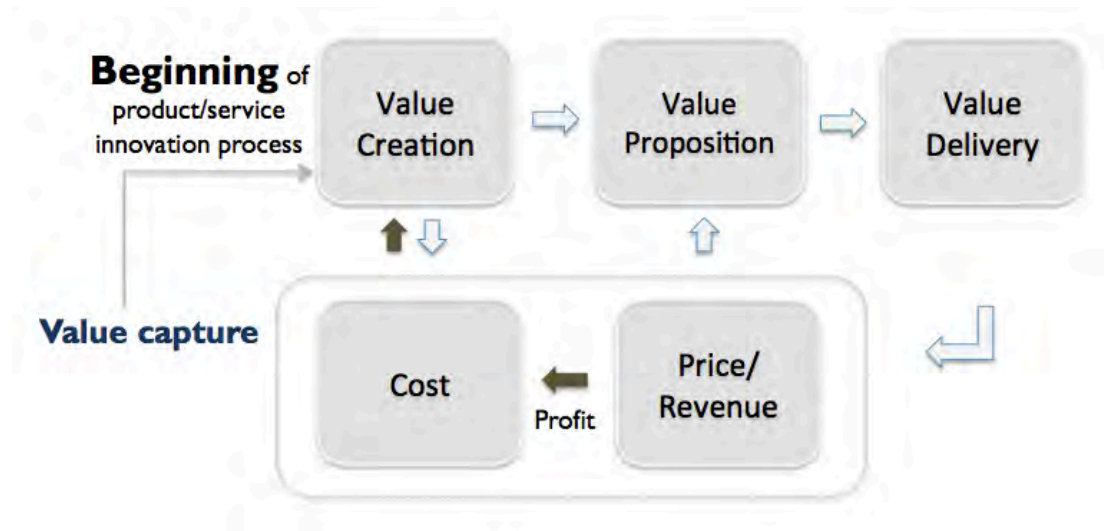


Figure 3 Top-down business model

Source: authors' own elaboration

The key difference between these two approaches is the way that market information is built into an actual innovation. In order to design the product or service around the price, there is a need for paradigm shift: moving from the traditional bottom-up approach to

top-down approach. This mindset change will ensure that the product or service is not only desirable and affordable to the customers, but also profitable to the firms.



Source: Scanpix / Iris

10 3 WHAT IS TARGET COSTING

3.1 The definition of target costing

Target costing was originated from the Japanese automobile industry in 1960s and then was successfully introduced to Western companies since 1980s (Feil *et al.*, 2004; Kim, *et al.*, 1999). Many large companies in North America and Europe have adopted target costing to enhance their cost management and thus increase their competitiveness (see for example Bhimani and Neike, 1999; Caleb, *et al.*, 2007; Ellram, 2006; Nicolini, *et al.*, 2000; Dekker and Smidt, 2003; Rattary *et al.*, 2007).

Various definitions of target costing have been discussed by the Japanese scholars (Kato, 1993). In this paper, target costing is defined as a system of profit planning and cost management that is price-led, customer-, design-centered and cross functional (Ansari *et al.*, 1997). It focuses on 'what should the product cost' instead of 'what does the product cost', thus ensuring that only profitable products are introduced.

By designing cost out of products, target costing creates the opportunity for cost planning during the

design stage. The main motivation is that after the product development stage most costs have been 'designed' into the product and costs cannot be influenced any more during manufacturing process (Dekker and Smidt, 2003). Here, the cost refers to the costs throughout the entire product life cycle. Earlier cost planning also contributes to an optimal trade-offs between cost, functionality and quality by deploying cross-functional teams in the organization (Rattary *et al.*, 2007).

The application of target costing is highly beneficial as competition grew fiercer and profits weakened, because prices are then increasingly determined by market forces rather than by simply marking up the cost with a sufficient profit (Feil *et al.*, 2004). It can also be beneficial to involve members of the value chain, such as suppliers and distributors. In that way, pressures stemming from the market can be passed on to extended enterprises to encourage their creativity and cost control (Rattary *et al.*, 2007).

3.2 Target costing process

The basic idea of target costing is fairly simple and straightforward. It is obtained by deducting the desired profit from the selling price:

$$\text{Target cost} = \text{Selling price} - \text{Target profit}$$

However, the process of target costing is complex and multifaceted. It can be generally broken down into two phases as shown in Figure 4.

- 1) The establishment phase occurs during product planning and concept development stages and involves setting a target cost;
- 2) The achievement phase occurs during the design development and production stages and involves achieving the target cost (Everaert, *et al.*, 2006; Ansari *et al.*, 1997).

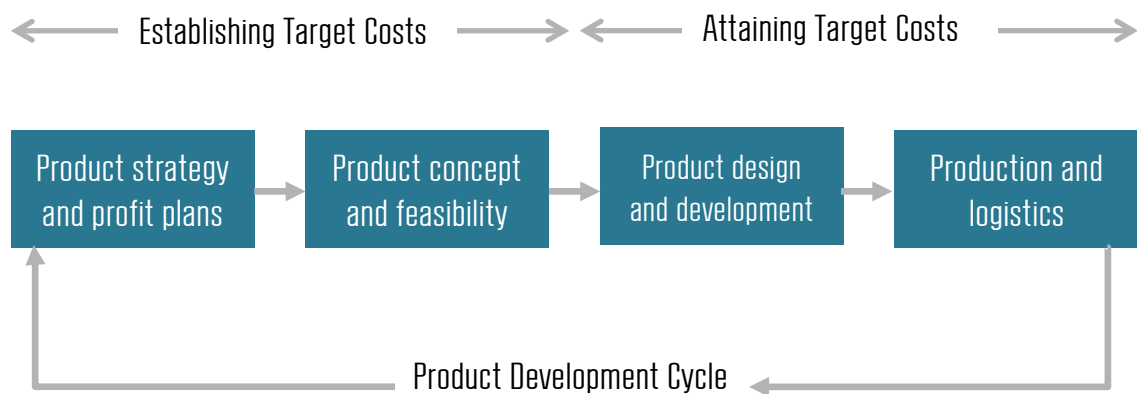


Figure 4 Target costing and the product development cycle

Source: Ansari, et al. (1997)

The primary steps in the first phase are:

- 1) Understanding customers' requirements and their willingness to pay
- 2) Defining product or service features based on market research and customer insights
- 3) Establishing the selling price given product's quality and functionality
- 4) Setting the target profit margin

When establishing the selling price, the price level of existing products or competitor's price level typically provides an initial starting point. Other factors can also be considered, such as firm's current competitive positioning, long term market penetration objective and product mix. Thus it reflects the firm's strategy, competitor's strategies and customer demand (Ax *et al.*, 2008; Everaert, *et al.*, 2006; Ellram, 2000). The

required profit is typically expressed as return on sales (ROS) ratio (Ansari *et al.*, 1997). Different products may have different profit margins, depending on the pricing strategies, cost position of the firm and level of investment required (Ax *et al.*, 2008). While first phase focuses on the planning process, the attaining phase deals with activities of cost reduction. The major steps include:

- 1) Determining the target cost
- 2) Estimating the initial cost based on current cost factors
- 3) Computing the cost gap between target cost and current cost
- 4) Designing product or service to close the cost gap
- 5) Releasing the cost-effective design when attaining the target cost
- 6) Undertaking continuous improvement on cost reduction

Cost reduction through design involves breaking down the product-level cost, to function- and component-level cost (Cooper and Slagmulder, 2002). This allows the identification of cost drivers, which provides the greatest opportunity for cost reduction or process

improvement (Ellram, 2000). Tools and techniques such as value engineering will support the process by recursive problem solving (IMA, 1998). The implementation of tools and techniques falls out of the paper scope and will not be addressed further.



Source: Scania / Iris

4 HOW CAN TARGET COSTING SUPPORT THE MARITIME INDUSTRY

Most of the previous literature on target costing has focused on the implication of target costing on management accounting or on the general application of target costing (Nicolini, *et al.*, 2000; Dekker and Smidt, 2003; Rattary *et al.*, 2007). For the maritime sector, target costing is relatively an uncharted territory. There has been only limited research on applying the target costing for cost management in shipbuilding sector (Fafandjel, *et al.*, 2008; Yasukata, *et al.*, 2013). As newbuilding price is market determined, it is an imperative to act with the newbuilding production cost optimization. Target costing therefore provides the possibility to influence on larger part of these shipbuilding costs within the production process (Fafandjel, *et al.*, 2008).

This section attempts to fill the research gap by making the explicit linkage of target costing to the marine equipment manufacturing industry. Since target costing is environment-specific, it would be beneficial to understand the industrial status. Currently, the marine equipment manufacturers and service providers are facing two major challenges.

First of all, the industry is transforming from the product-centric to the customer-centric model by offering various product-service solutions (PSS). When offering such PSS, it is strategically important to understand how to set the price and manage the cost to be profitable while ensuring the quality and functionality. It has become even more crucial today when ship owners have been suffering a huge downturn of profit during periods of recession and shipping overcapacity. Ship owners are therefore

more sensitive to differences in selling prices. Highly sophisticated customers are even able to attach different values to offerings from different suppliers (Ansari, *et al.*, 2007). Consequently, equipment suppliers have less space to maneuver with the selling price, and must focus on costs to realize an adequate profit margin and to achieve certain market penetration objectives (Dekker and Smidt, 2003). To make things even more complicated, service contract types range from simple spare parts contracts to customized- and performance-based contracts (Avlonitis *et al.*, 2014). Each contract type presents different cost structures and time horizons. With long-term and performance-based contract, it requires suppliers to be able to estimate the potential costs and get an appropriate balance of risks and rewards.

Another industrial challenge is the intensified environmental awareness and regulation. IMO, regional and national regulatory bodies, as well as shippers are pressuring marine equipment suppliers to meet environmental protection regulations. When designing product or service, the environmental sustainability should be addressed in the same way as other product or service features, considering customer's willingness to pay and environmental-related costs. In an economic down turn, the customer's willingness to pay may be lower, and that could place the marine equipment suppliers at a competitive disadvantage. But if suppliers are able to offer an environmentally superior product or service with the market-driven design but still achieve economic success, they can gain a competitive advantage. Target costing, in this instance, can serve

14 as a useful tool to design the environmental consideration and related-cost as additional constraint into the product and service.

Therefore, the implementation of target costing can be combined with environmental sustainability to cope with the tightening environmental standards in the maritime sector. It will also help marine equipment suppliers better manage the economic-

and environmental- related costs. Firms therefore can integrate key metrics, such as price, cost, profit, energy usage, environmental performance of product and service in the overall decision- making framework.



Source: Scanpix / Iris

5 CONCLUSION

Turning innovation into profit is of strategic importance to firms today and the true value of innovation can only be captured when it succeed in commercialization. Many innovations have shown that focusing on product engineering and ignoring the customer will end up failing.

Starting with the market and customer, target costing can be applied as a strategic tool to successfully commercialize the product and service innovation. In this way, innovators don't simply design products or services to make better use of technologies and processes; they design products or services that will meet the price required for market success. This price will, on one hand, impose the cost-reduction target in the organization. On the other hand, it can be a driving force for improving the cost-effective design and internal operations.

Target costing can also be a valuable tool for the marine equipment manufacturing industry to response to the intensified competition and environmental regulation. Environmental consideration and its cost impact can be evaluated in a similar way as other manufacturing features and successfully designed into its product and service process. Target costing can also facilitate the industry's transformation from product manufacturers to integrated solution provides, by planning cost and profit associated with providing product-service solutions.

Now more than ever, firms must rethink the practices of commercializing innovation to strength hits business position. Only with sufficient engineering competency and commercialization skills, can a firm gain market share and experience economic success.



Source: Scanpix / Iris

ACKNOWLEDGEMENTS

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APPENDIX A. BLUE INNOSHIP

Blue INNOship is a societal partnership focusing on creating growth and employment in the Blue Denmark through development of green and energy-efficient solutions.

Blue INNOship consists of app. 40 partners covering suppliers, shipowners, consultants, universities and schools, GTS institutions, authorities and classification societies, who work together in 5 work packages containing 14 active projects and 1 pre-study.

The long term objective of Blue INNOship is to develop an innovation model for the Danish maritime industry and the partnership is an investment in the development of this strong common innovation model that will offer a central, competitive advantage for the Danish maritime industry.

The activities in Blue INNOship are funded by the project partners, Innovation Fund Denmark, the Danish Maritime Fund and Orient's Fund.



APPENDIX B. BLUE INNOSHIP PROJECT NO.15

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Servitization: Creating the market by understanding price, cost, contracts and financing

Project background

As part of the Blue INNOShip, Copenhagen Business School together with Danish maritime carries out the project 'Servitization - Creating the market by understanding performance, price, cost, contracts and financing'. Focusing on the critical success factor in servitization, the project aims to advance the dialogue between the Danish equipment manufacturers/service providers and ship owners. In particular, the project looks at the pricing practice and cost management of product-service solutions, design of service contracts, and financing of servitized solutions.

Project highlights

This project aims to advance the manufacturer-ship owner dialogue with focuses on the following aspects:

Price and cost - Building up the competencies of suppliers in pricing strategy and cost management of product-service solutions by considering market, design, life cycle and value chain; and building up the competencies of ship owners to strategically select the reliable supplier, product and service.

Contracts - Establishing new specific knowledge about how contracts can enable the transformation from one-off transactions to long-term collaboration between supplier and ship owner that encourages innovation and technical development by e.g. ensuring balance between risk and reward.

Financing - Creating specific insights into understanding how to link scale, profitability and financing of servitized solutions for the industry.

Project participants

CBS Maritime and Danish Maritime

Project Homepage

For more information on the project and upcoming activities, please visit the CBS Maritime website

<http://www.cbs.dk/en/knowledge-society/business-in-society/cbs-maritime/research/research-projects>

APPENDIX C. PROJECT NO.15 THEMATIC SEMINARS

Seminar theme	Seminar dates
1. Target costing as a strategic tool to commercialize the product and service innovation (finalized)	3 October 2016
2. Pricing management and strategy for the marine equipment suppliers	14 December 2016
3. Optimization and handling of risks and cost within contracts	1 March 2017
4. Strategic decision-making of ship owners in investing in marine equipment and selecting suppliers	7 June 2017
5. Financing of new business models that can promote business and sales within the maritime industry – general	20 September 2017
6. Financing of new business models that can promote business and sales within the maritime industry – cases	6 December 2017
7. Negotiation and collaboration through international contracts	22 March 2018
8. Final Conference	14 June 2018
Optional: marine equipment leasing workshop	6 February 2018

Note: The project partners reserve the right to adjust the themes and timing of the remaining seminars according to the interests of the stakeholders and the progress of the project activities.

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For additional information on the project, please contact the project contacts above.

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