



**UNIVERSITY OF GOTHENBURG**  
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# **‘In the Region for the Region’ – Tailoring Solutions to the Mid-Segment in Emerging Markets**

A case study of Bühler Bangalore’s Mid-Segment Innovations

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## Abstract

Western MNCs active in emerging markets have traditionally catered the high-income customers of the premium-segment. Meanwhile, the economic growth in emerging markets, such as China and India, has led to a vast mid-segment with differing needs. In order to partake in this opportunity, literature has advocated that Western MNCs must re-evaluate their product offerings, business models and organizational structures. However, few studies have delved into *how* this phenomenon occurs, compared to the much more researched product innovation side. Hence, the purpose of this study is to outline how this development is organised within the local R&D unit, its implications for other departments, and which characteristics must be kept in mind when innovating for the mid-segment customers. By conducting a case study at Bühler Bangalore, subsidiary of the Swiss technology company Bühler Group, including 15 interviews with managers involved in the development of two mid-segment innovations, this paper contributes with four main findings; first, MNCs should not only innovate on the product side, but tailor each component of a business model to the characteristics of the mid-segment, by applying a network perspective on the development process. Second, mid-segment characteristics differ to the premium, implying time pressures on the development. Third, the underlying organisational structure has an impact on the process, facilitated by setting up a separate unit to spur local innovation. Last, this study finds increased interdepartmental collaboration, when innovating for this segment.

**Key Words:** Emerging Markets, Mid-Segment, Business Model Innovation, R&D Network, Development Process, Internationalisation of R&D

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## List of Abbreviations

B2B - Business to Business

B2C - Business to Consumer

BBAN – Bühler Bangalore

CT - Corporate Technology

CEO - Chief Executive Officer

CTO - Chief Technology Officer

EMNE - Emerging Market Multinational

HQ - Headquarter

HR - Human Resources

IGCC - Indo-German Chamber of Commerce

M2M - Market to Market (unit)

MNC - Multinational Corporation

MS - Milestone

PPP – Purchasing Power Parity

R&D - Research and Development

SME Millers - Small and Medium Sized Millers

TPH - Tonnes per Hour

TPD - Tonnes per Day

USP - Unique Selling Point

# 1. Introduction

*This chapter gives an introduction to the background of the topic, leading to the problem discussion, where the research gaps are outlined. Subsequently, the purpose and research question is presented, followed by the delimitations of this study.*

## 1.1 Background

In the aftermath of the financial crisis, the global economic growth has remained slow. This has become especially evident in the economic stagnation and increasingly saturated home-markets experienced in Western nations, with gross domestic product growth lingering around 1.6 percent in 2014 (World Bank, 2016; UNCTAD, 2015). Developing countries on the other hand, have displayed a much brighter picture (UNCTAD, 2015), with the greatest contributors being the emerging markets of India, China and within South-East Asia, reaching growth levels close to 7 percent the same year (World Bank, 2016). Consequently, global growth patterns are shifting. In this line, emerging markets have enjoyed increasing inward foreign direct investment flows, reaching historically high levels in 2014 (UNCTAD, 2015). This provides a strong indication of an increased number of Western multinational corporations (MNCs) establishing subsidiaries in these markets to partake in the opportunity provided there. Currently, many of these fast growing countries are experiencing a structural change in their economy. Among others, favourable demographic developments, with an extensive amount of the population entering working age, combined with a trend towards urbanisation, alongside political reforms and increased infrastructure spending, which has led to an increase in disposable incomes. This has led to a growing mid-segment with increased purchasing power (Kharas, 2010; Bergakker & Speetjens, 2015). However, Western MNCs have traditionally concentrated on offering premium products for high-income customers in emerging markets (e.g. Anderson & Billou, 2007; Gebauer et al., 2009; Hart & Christensen, 2002; Little, 2008; Prahalad & Mashelkar, 2010). During the last years, this has left enough time for local competitors and a growing number of emerging market multinationals (EMNEs) to successfully establish themselves in the mid-segment (Little, 2008) which is outlined in Figure 1.1 below. Further, competitive pressures are intensifying, as EMNEs are increasing their market share in areas where Western MNCs have held a dominant position throughout history, i.e. the premium-segments in emerging markets (Gadiesh et al., 2008; Ramamurti, 2012; Williamson et al., 2013; Zeng & Williamson, 2003). Hence, the combination

of saturated home markets, untapped growth opportunities in the mid-segment, and the growing local competition is changing the way how long established Western MNCs do business (London & Hart, 2004). To ensure sustainable growth-levels in the long-term, Western MNCs should revise their current premium centric, global strategies, for an entry into the mid-segment of emerging markets (Hart & Christensen, 2002).

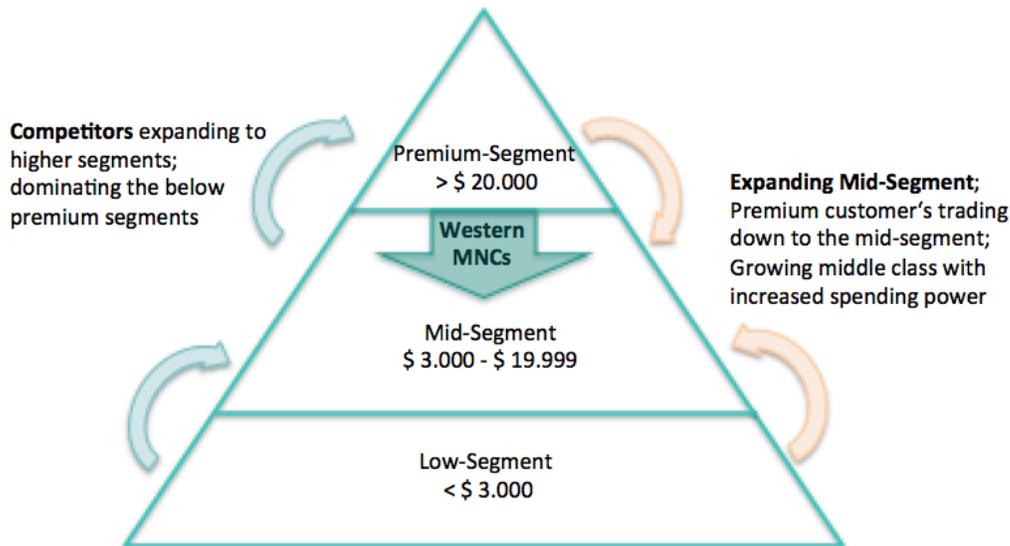


Figure 1.1 The Economic Pyramid, Annual Purchasing Power Parities (PPP) and the EMNE Move Towards the Premium-Segment. Compiled by authors, adopted by Little (2008) and Hammond et al. (2007)

## 1.2 Problem Discussion

The traditional strategic approaches MNCs adopt when entering emerging markets, have mainly targeted the high-income, top of the pyramid. This has been regarded as a major reason for why many MNCs are struggling in their pursuit to tap into the enormous opportunity of the below premium-segments (e.g. Govindarajan & Trimble, 2012; Hart & Christensen, 2002). Looking deeper into this phenomena, Western MNCs that have identified the enormous volume and revenue-potential embedded in the vast mid-segment, have employed a ‘glocalised’ approach in terms of their product offering (e.g. Govindarajan & Trimble, 2012; London & Hart, 2004). This has led to a number of ‘light’ versions of Western premium products (Shankar & Hanson, 2015), which often are over-engineered (Christensen et al., 2001), too expensive, or not sufficiently catering to the needs of the mid-segment (Eyring et al., 2011; Little, 2008). Simultaneously, a growing number of EMNEs are mastering the challenge of low-cost innovations, often using inferior technology to that of Western MNCs, but still presenting affordable, yet ‘good-enough’

quality solutions suitable to the local customers (Gadiesh et al., 2009; Ramamurti, 2012). Hence, in order to successfully compete in these markets, Western MNCs must develop capabilities in creating more affordable solutions of equal quality standards (Eyring et al., 2011; Jullens, 2013; Shankar & Hanson, 2015). In this line, global research and development (R&D) networks are on the rise, with Western MNCs building up facilities in emerging markets to tap into local knowledge and get closer to target customers. This is an important step, but often inherits ‘Westernised’ innovation patterns, which are deemed not appropriate in order to succeed in these markets (Tiwari & Herstatt, 2012; Zeschky, Widenmayer & Gassmann, 2014). Instead, literature has brought up numerous examples such as ‘frugal’ (Economist, 2010), ‘cost’ (Williamson, 2010), ‘good-enough’ (Gadiesh et al., 2007), and ‘disruptive’ (Christensen, 1997) innovations of especially EMNEs. Concepts, which in this study are collectively referred to as ‘*innovations targeting the mid-segment in emerging markets*’ for unlimiting reasons, mitigating the risk of omitting essentialities of their respective characteristics. Although the concepts are signifying some differences, they provide highly valuable insights of the capabilities needed to successfully innovate for the more resource-constrained customers (London & Hart, 2004; Prahalad, 2012). However, there are several gaps to be found in this relatively new area of research.

First, reviewing the literature regarding the abovementioned innovation concepts, there are few studies delving into the actual *how* such innovations can be developed within a MNC. In order to successfully cater to the needs of this fast growing mid-segment prevalent in emerging markets, researchers advocate that Western MNCs should not only re-evaluate their current product offerings, but re-consider parts of their business model and organizational structure (e.g. Eyring et al., 2011; Govindarajan & Trimble, 2012; Little, 2008; London & Hart, 2004; Prahalad, 2012; Ramamurti, 2012; Zeschky, Winterhalter & Gassmann, 2014a). However, current literature on the *how* and the specific factors needed for success in the mid-segment, rather provides descriptions of anecdotal nature, as opposed to the much more researched characteristics on the product side (Zeschky, Winterhalter & Gassmann, 2014b).

The second gap refers to the abovementioned lack of research in combination with the role of the innovators, i.e. the local R&D unit in the emerging market. In fact, for a venture to be successful in the below premium-segments, product and business model innovation must evolve jointly (e.g. Assink, 2006; Eyring et al., 2011), indicating that the local R&D network has an important role in the development. This implies that there is a need for the MNCs to ensure close collaboration

between practice and process (i.e. R&D and the value chain, manufacturing, sales, distribution etc.), in order to tailor solutions to the specific characteristics of the mid-segment customers (Assink, 2006; Bhatti, 2012). Given the central role of the R&D unit within the development process, more studies should delve into the organization of the R&D network and its collaboration with other departments along the value chain, as it is a rather undiscovered area in terms of academic research.

Third, this line of literature has incorporated a high level of cases relating to the business-to-consumer (B2C) industries. This has left the business-to-business (B2B) area rather undiscovered, with researchers just briefly touching upon the subject. Zeschky, Widenmayer and Gassmann (2014) have also identified this gap in research and call for future studies regarding how MNCs should organise themselves to spur such innovations in B2B industries. This requests more research studying B2B industries in isolation, as there exist implications that B2C industries could be more accepting toward such solutions (ibid.).

Ergo, this novel line of literature is in need of an additional piece of the puzzle that addresses the gaps identified above. Therefore, this study takes place in Bangalore, where Swiss food processing technology manufacturer Bühler has been present since 1992. Over the past years, Bühler predominantly targeted the top segment in emerging markets by offering high-end milling solutions. For years, the trend and focus has been towards more efficiency seeking, meanwhile a broad base of potential customers has emerged from below. Notwithstanding, these mass markets have been widely overlooked by Western MNCs like Bühler, leaving enough room for strong local competition to establish themselves in the lower segments. Today, these local competitors are challenging the incumbent's position by expanding into the higher capacity segments at the top of the pyramid. This, in combination with the growing potential in the mid-segment, leads to an opportunity that Bühler can no longer ignore. Therefore, during the last year, Bühler has responded by developing two mid-segment products, namely the SmartLine Rice processing machines and the Mini-PESA mill, targeting the lower capacity mid-segment. Hence, the case of Bühler as a Western technology company mirrors the macroeconomic situation outlined in the background before, and therefore serves as an ideal unit of analysis in order to fulfil the research gaps identified above.

### 1.3 Purpose and Research Question

The purpose of this study is to fulfil the abovementioned research gaps and gain insights on *how* Western MNCs organise, and which capabilities are needed to successfully target the B2B mid-segment in emerging markets.

#### Research Question

In order to cover the abovementioned objectives, the following research question will guide this study:

***How do Western MNCs organise their development process when innovating for the B2B mid-segment in emerging markets?***

Due to the broad range of the given research question, this study ascends from the perspective of the local R&D network and *how* it is organised connected to the product development process itself. Accordingly, this study focuses on the two following aspects:

First, this study intends to clarify which characteristics are important to bear in mind when innovating specifically for the mid-segment in emerging markets. This is done by analysing the development process of two mid-segment products compared to their premium counterparts, with the aim to identify the peculiarities of this particular segment. The choice of two examples from different business units intends to create a deeper understanding, than if the research was solely relying on the case study of one product. Second, this study takes the local R&D department as the central unit of analysis and aims to identify the underlying organizational factors facilitating this type of innovation. Furthermore, it investigates the organization of the development process itself and its implications for other departments along the value chain, adapting a network perspective on innovation and R&D. This is a necessary step in order to contribute to a more holistic picture in this area of research and not only focuses on the product side of this type of innovations.

Consequently, this study aims to provide valuable insights to develop this relatively ‘novel’ field of research by adding to a more detailed, three sided picture of what characteristics differentiate the mid-segment from the premium-segment, how the underlying organizational structure facilitates this type of innovation to tap into the growing mid-segment in emerging markets, and how the identified characteristics influence the organisation of the development process.

## 1.4 Delimitations

Primarily relating to the chosen approach this study takes, it comes with a number of limitations possibly affecting the validity and reliability of the findings. First, as this case study is limited to the unique context of Bühler Bangalore, it might affect the extent to which the findings are attributable to other contexts. This implies that differing industry characteristics or market situations, may affect the development process. Second, this study ascends from the perspective of the local R&D unit of a Western MNC, implying that the company has an established presence in the target market, serving the premium-segment. This means that the findings of this study might be of limited applicability to companies in the initial stages of entering the market, as the lack of local operations, employees and experience provide a completely different starting point. Third, this study investigates the development process of two different innovations, whereas it has to be mentioned that the Mini-PESA mill has not been launched yet, meaning that the planning of the marketing and sales initiatives is not finished. Therefore, the information concerning the actual market introduction is based on one product. However, it needs to be highlighted that the Mini-PESA has went through the majority of its development, meaning that it still serves to bring valid insights of its process. Fourth, it is of importance to bear in mind the time aspect of this study, being present only two weeks on-site. As the product development process spans over a long time, sometimes several years, it is possible that some aspects have not been covered on a deeper level. Yet, as the interviewed managers held key-roles in the development processes, and the questions stimulated to provide rich description of the process through storytelling, it is presumed that the most significant aspects have been captured in this study. Last, this study mainly focuses on the organizational factors considered to facilitate the development of this type of innovations. Therefore, the inhibitors of such a development process are not emphasised in this study to the same extent.

## 1.5 Research Outline



This thesis covers six chapters in total, offset by the foregoing introduction. The next chapter presents the literature review, including the organization of R&D networks, local subsidiary roles, and organizational capabilities facilitating mid-segment innovation. Second, network models of new product development are outlined. Followed by clustering factors of the mid-segment into the components of a business model, including segment characteristics, a typology of innovations targeting the mid-segment, organization of the development process, and last, the local external environment. These provide a basis for establishing a conceptual framework, which is later, utilised and revised building on the findings derived from the case study. Chapter three describes the methodology used in order to fulfil the aim of this study, providing information on e.g. the data collection technique, and analytical method. Fourth, the empirical findings are presented by first introducing the company, and the organizational factors facilitating the innovation process to establish a context. Thereafter, Bühler's entry in the Indian mid-segment and its characteristics are outlined, followed by the standard development process to offer a comparison to the development process of the mid-segment products. Last, implications for other departments along the value chain are outlined. In chapter five the theoretical background is applied to the empirical findings, which are thereby analysed. The results of the analysis are last illustrated in a revisited version of the conceptual framework provided in the theoretical chapter. Section six summarises the study, and highlights its most prominent findings, thereby answering the research question of *how Western MNCs organise their development process when innovating for the B2B mid-segment in emerging markets*. Included in this chapter are also managerial implications and suggestions for future research within this field.

## 2. Literature Review and Conceptual Framework

*This chapter will start by reviewing the organization of the R&D network, setting out the role of the local subsidiary. Thereafter organizational capabilities facilitating mid-segment innovation are established, succeeded by presenting a network model of new product development. This is followed by clustering factors of the mid-segment into the components of a business model, including the target segment characteristics, the typology of innovations targeting the emerging market mid-segment, the organization of the development process, and last, the local external environment. Ultimately, a conceptual framework is outlined, linking all theoretical findings together.*

### 2.1 The R&D Network, Subsidiary Role, Organizational Factors

#### 2.1.1 Organization of the R&D Network and the Role of the Local Subsidiary

Traditionally, MNCs internationalised by establishing sales and service units while keeping their main R&D function in their home countries, thereby offering their Westernised solutions around the globe. Kummerle (1997) first postulated that this centralised approach of R&D will no longer suffice in a globalised world, where the MNC must absorb the knowledge from multiple sources, in order to meet the needs of customers in various countries. Consequently, Kuemmerle (1997) introduced two types of R&D sites: the ‘home-base-exploiting’ and the ‘home-base-augmenting’, whereas the central R&D hub is located at the headquarter (HQ). The first draws completely on the technology and knowledge held by the HQ and is established to perform minor product adaptations, in collaboration with the local manufacturing facilities. Hence, technological knowledge mainly flows from the central R&D site in the home country to the R&D unit at the foreign subsidiary. The latter refers to a R&D site, which is established to tap into the knowledge of local universities, competitors and establish linkages to institutions, where the gained knowledge flows back to the central R&D at the HQ (ibid.). In this line, the trend of internationalising and thereby decentralising the R&D function has been witnessed over the past years (UNCTAD, 2005). However, the attempt of achieving global integration while offering local responsiveness still produces solutions that are often too expensive and over-engineered for the resource-constrained consumers of the mid-segment in the emerging markets (Mudambi, 2011). Hence, MNCs have to manage the challenges of increased organizational complexity, stemming from the embeddedness of the organization in multiple corporate and local contexts, in

order to harness the fruits of their dispersed innovation network (Mudambi, 2011). Subsequently, the rise of the mid-segment with an increased demand for affordable, locally tailored products, alongside enhancing subsidiary capabilities, calls for a reorganisation of the traditional hub and spoke system of R&D activities into a global network of innovation through the establishment of local R&D units, transforming the MNCs footprint into an interweb of dispersed R&D activities (ibid.; Cantwell & Mudambi, 2005).

In order to further outline the context in which the local subsidiary develops innovations targeting the mid-segment in the emerging market, factors regarding the HQ-subsidiary relationship influencing the organization of the R&D network must be considered. To begin with, a fact often overlooked by current literature on the organization of R&D networks, is the distinction between applied research, compared to product- and process development (UNCTAD, 2015). Applied research mainly refers to tapping into technological know-how and talent present in a specific region, which could be linked to the concept of a ‘home-base-augmenting’ subsidiary, whereas product- and process development in turn focuses on the development activities, represented by the ‘home-base-exploiting’ subsidiary (Zeschky, Widenmayer & Gassmann 2014). Today, the majority of internationalised R&D functions focus more on the development side, exploiting existing global MNC competencies, while responding to local market requirements. Additionally, whereas the above stated approach of Kuemmerle (1997) distinguishes between different roles and activities of each R&D site, it is tied to a locational parameter whereby the subsidiary takes either an ‘augmenting’ or ‘exploiting’ role, which due to today’s global complexity may no longer hold true. Hence, a subsidiary could have areas performing a home-base augmenting activity, whereas during other projects, it might exploit advantages and technologies provided by the HQ (Cantwell & Mudambi, 2005). Last but not least, Rugman et al. (2011) postulates that subsidiary roles may be different depending on the type of value chain activity. This means that a subsidiary can have a different role in production, e.g. offering locational advantages such as low labour cost, as compared to its role in innovation and R&D. Additionally, it has been recognised that subsidiary roles may change over time and that with increased creativity and organizational maturity, subsidiaries may bargain for the assignment of new product mandates (Cantwell & Mudambi, 2005).

The abovementioned development implies managerial challenges to fully leverage on the innovative capability and knowledge created within the international R&D network (Kuemmerle, 1997). Hence, in order to develop successful innovations for the mid-segment in emerging markets, the R&D structure has to be adapted to the factors that stimulate this type of innovation (Zeschky, Widenmayer & Gassman, 2014), which will be reviewed in the next section.

### 2.1.2 Organizational Factors Facilitating Mid-Segment Innovation

First, several authors point out the underlying mind-set necessary to create this type of innovations for the more resource-constrained customers in emerging markets (Jullens, 2013; London & Hart, 2004; Zeschky, Widenmayer & Gassmann, 2014). According to Prahalad (2006), Western MNCs struggle to develop solutions for these new customers, as their mind is tied to their previous successfully proven business practises and innovation processes, hence often applying their ‘Westernised’ approach on innovation. In this line, Zeschky, Widenmayer and Gassmann (2014) found that most Western MNCs base their business models on the needs of Western customers with much higher living standards and purchasing power, which often proves insufficient when applied to emerging markets’ mid-segment. Further, R&D was traditionally carried out in the central unit, leading to the challenge that R&D managers with a Western mind-set have a difficulties in reversing their thinking to make products more simple and affordable, as they are used to come up with sophisticated, advanced technological solutions. (EY, 2011; Zeschky, Widenmayer & Gassmann, 2014). Therefore, companies should question existing long-established practices, leave their comfort zone and start from zero when developing solutions for this new type of target markets (Immelt et al., 2009; Prahalad, 2006). In this vein, local recruitment mechanisms are of crucial importance to make use of the abundant local talent available, offering the advantage of tapping into local market knowledge and networks (Immelt et al., 2009; Shankar & Hanson, 2015).

Second, it has been found that in terms of governance, top management commitment (Immelt et al., 2009), and establishing direct communication channels between the subsidiary management and the parent company top managers, are of crucial importance to give these innovations a voice and reduce the risk to be overlooked by applying traditional Western approval mechanisms. This means that the innovation capability is positively related to a flat organization, providing an environment to make fast decisions and try out things (Mudambi, 2011). Zeschky Widenmayer

and Gassmann (2014) propose to assign more direct product development responsibilities to native managers at the subsidiary.

Third, most studies point at the level of autonomy granted to the subsidiary as a key factor for successful innovations. In more detail, profit and loss responsibilities, the award of a global product mandate, and developing an own strategy for the new market segment are identified as important factors (Govindarajan & Trimble, 2009; Hart & Christensen, 2002; Mudambi, 2011; Jullens, 2013). Additionally, many companies have started to use their R&D sites in emerging markets as hubs to access other future growth markets in the developing world, thereby awarding more responsibility to these regional centres and further decentralising their R&D network (Mudambi, 2011).

Summing up, from an organizational perspective, MNCs aiming to target the mid-segment in emerging markets have to establish an R&D unit close to the target market, while ensuring top management commitment and establishing a culture facilitating this type of innovation. Further, enhanced subsidiary capabilities are expected lead to a diminishing HQ influence, whereas the MNC should use local employees to overcome the challenges of having a too Westernised mind-set.

## 2.2. New Product Development and Business Model Innovation

Whereas the last section highlighted the importance of establishing a local R&D unit and identified necessary underlying organizational conditions to facilitate mid-segment innovation, this section intends to connect these parameters to the actual innovation process. This is done by briefly reviewing the current approaches on new product development and linking it to the business model perspective by clustering the findings of previous studies on successful emerging market mid-segment innovations into the main components of a business model.

### 2.2.1 Network Models of New Product Development

Current network models of new product development rest on the assumption that successful new product development requires inputs from various functions, such as R&D, Sales, Marketing, Manufacturing, Distribution, and Finance. Further, it emphasises the importance of external linkages during the different activities of product development, such as accessing the input from customers, suppliers, distributors, universities, and alliances, thereby setting the local subsidiary and the product development process in relation to its external local environment. Therefore, such

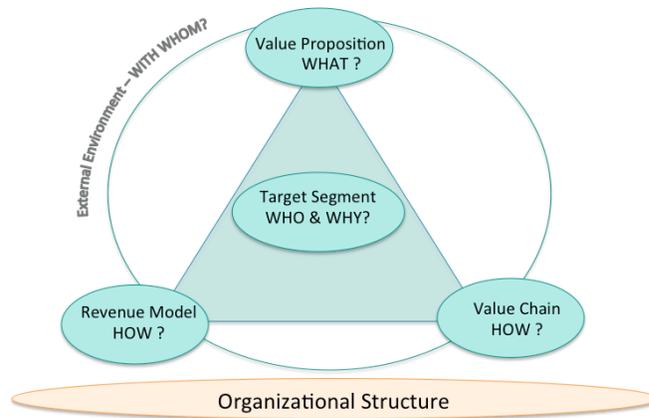
models see the product development as a series of interlinked activities, where different phases of the development process take place simultaneously and must not necessarily be in subsequent order. Further, the type of activity varies based on the industry and the context of the innovation effort (Trott, 2012). Hence, MNCs need to develop the capability of using cross-functional teams, applying a network perspective on new product development, in order to leverage on the knowledge, perspectives and experiences available in their global internal and external network. Therefore, the product development process is an incremental accumulation of knowledge relying on the close collaboration of all functions (e.g. R&D, marketing, sales, manufacturing, and distribution), where there is an exchange with external partners during the series of interlinked activities of new product development process in place (ibid.) Whereas the above-presented network highlights the close collaboration between all functions, it does not provide any guidance of the activities that need to be performed. Hence, this study takes a business model perspective on the innovation process, to structure the way the cross-functional product team gets from generating an initial idea, to presenting a viable solution within the R&D network.

### 2.2.2 Business Model Innovation

Innovative business models of local organizations, have been outlined as a valuable benchmark for Western MNCs, to overcome the challenges stemming from institutional constraints, lacking infrastructure and volatile government policies found in emerging markets (Ramamurti, 2012). Hence, the importance of business model innovation to develop successful innovations for the mid-segment in emerging markets is widely recognised (e.g. Eyring et al., 2011; Prahalad & Mashelkar, 2010; Ramamurti, 2012). However, none of the authors really define what is actually meant by this term. Chesbrough and Rosenbloom (2002, p.8) refer to business models as “*the architecture of revenues*”, specifying how companies make money out of their offering. Teece (2009, p.174) goes one step further and specifies business models as “*value propositions that are compelling to customers, achieves advantageous cost and risk structures, and enables significant value captured by the business that generates and delivers products and services.*” Hence, it can be argued that it is an overall approach on ‘how’ companies do business (Massa & Tucci, 2014; Zott et al., 2011) and for the purpose of this study a business model innovation is seen as a sequence of activities consisting of a firm’s value chain activities, the identified target segment and the chosen products or services on offer, while taking the peculiarities of the local environment into consideration (Winterhalter et al., 2015). This definition is visualized drawing

upon the proposed model by Gassmann et al. (2013) and Lindgardt et al. (2009) resulting in four main interlinked elements (see Figure 2.1): Target Segment (Who? & Why?), Value Proposition (What?), Value Chain and Revenue Model (How?) extended by the Local environment (With Whom?).

*Figure 2.1 Components of a Business Model. Compiled by authors,*



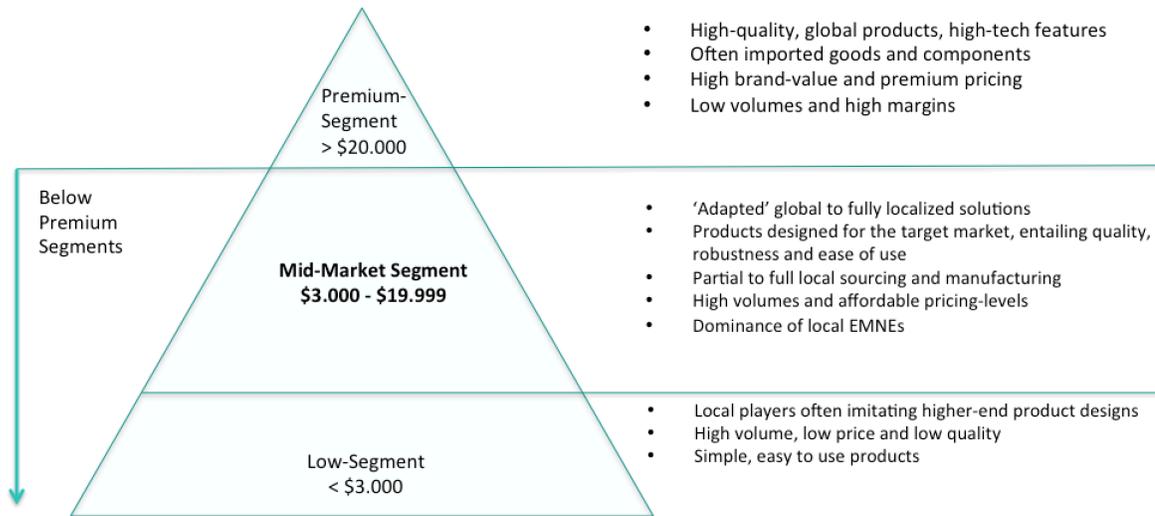
*based on Gassmann et al., (2013) and Lindgardt et al. (2009)*

In the following, important factors found while reviewing the literature on creating successful innovations for the mid-segment in emerging markets, are clustered into these five elements. This shall provide an overview of the findings propelled by existent studies of this topic.

#### 2.2.2.1 Target Segment – Characteristics of the Mid-Segment in Emerging Markets

This element of the business model identifies the target customers with a specific need (Gassmann et al., 2013). Even though most literature within the field has focused on the very bottom of the pyramid (e.g. Anderson & Billou, 2007; Bhatti & Ventresca, 2012; Christensen et al., 2001; Hammond et al., 2007; Prahalad & Hart, 2002; Ramdorai & Herstatt, 2015) attention has also been paid to the rapidly expanding mid-segment, with an annual PPP of \$3.000-\$19.999 (e.g. Gadiesh et al. 2007; Gebauer et al. 2009; Hammond et al., 2007; Jullens, 2013; Little, 2008). This is not particularly surprising, as it is estimated to grow up to three billion people during the coming decades (Kharas, 2010; Prahalad & Mashelkar, 2010). This in turn, has led to changes in the purchasing trends and preferences of both, B2C and B2B customers, whereas pressure is stemming from two sides. On the one hand, the low-segment trades-up towards the mid-segment (Gadiesh et al., 2007; Gebauer et al. 2009), with business customers increasing the demand for higher quality and functionality (see Figure 2.2) (Little, 2008). On the other hand, the premium-

segment customers have gradually become more accepting towards cheaper local products of lower, yet ‘good-enough’ quality (Gadiesh et al., 2007; Gebauer et al. 2009).



*Figure 2.2 Market Segments, annual PPP levels and Corresponding Market Characteristics. Compiled by authors, based on Little (2008) and Hammond et al. (2007)*

MNCs active in the emerging markets’ try to achieve ‘glocalisation’ or the ‘transnational solution’, whereby they intend to reap the benefits of global efficiency, while partially adapting the offering to the local needs (Bartlett & Ghoshal, 1989). London and Hart (2004) highlight the problematic of this strategic approach, as it makes the organizations fail to ‘dig-deeper’ into the needs of the mid-segment (ibid.), as solving a specific problem better or cheaper than any existing solution, requires extensive customer insights (Gebauer et al., 2009; Hart & Christensen, 2002; Jullens, 2013). This is linked to the mind-set discussed before, as often it is difficult for a Western R&D managers, or even local top managers, to put themselves into the shoes of the resource-constrained customers and fully understand their daily challenges (Prahalad, 2006). This is further supported by Ramamurti (2012) who highlights a deeper understanding of the mid-segment needs, as one of the main competitive advantages of local emerging market organizations. Yet, this does not mean compromising on quality, but rather to tailor the products perfectly to the unique needs of the mid-segment (Jullens, 2013), to compete with the deeply embedded local companies dominating this segment (Little, 2008). Therefore, it could be argued that Western MNCs have to allocate more resources to conduct extensive market research (Gebauer et al., 2009), whereas considering the insufficient statistical and market data available

in most emerging markets, it could be argued as an approach that might not prove as the most rewarding. Therefore, Eyring et al. (2011) propose a collaborative fieldwork with local partners as the most successful way to truly understand the local context (ibid.), which can be argued to be further facilitated by including local employees in the process (Immelt et al., 2009). This type of fieldwork subsequently includes studying how the consumers use the product, create an apprehension of not only competing products, but also the existing substitutes, identifying needs that are poorly satisfied, and last, understanding the consumers behaviour connected to the product, i.e. what they aim to accomplish with it (Eyring et al., 2011). GE constitutes a great example of this type of knowledge creation, building on an on-going R&D effort to create a less advanced and portable ultrasound machine. By establishing ‘local growth teams’ comprised by Chinese engineers, GE was able to identify and tailor their ultrasound perfectly to suit the needs of rural doctors in the country. The success of this innovation was largely attributed to the Chinese market insights of the team members, and the fieldwork conducted by those to create knowledge in areas, which it was lacking (Immelt et al., 2009).

#### 2.2.2.2 Value Proposition – Typology of Innovations

This element clarifies what should be offered to the customer to solve a specific need by offering a specific bundle of products or services (Gassmann et al., 2013). Innovations targeting the mid-segment in emerging markets have been commonly referred to as making a product affordable to a larger segment, without compromising on quality (e.g. Bhatti, 2012; Gadiesh et al., 2007; Jullens, 2013). However, reviewing the literature regarding innovations aiming at the mid-segment of emerging markets, it becomes evident that there is no clear distinction made. In fact, most of the innovation concepts have been used interchangeably (Zeschky, Winterhalter and Gassmann, 2014b).

First, Williamson (2010) uses the term ‘*cost innovation*’ suggesting a remodelling of features within the technical boundaries of the firm. This has also been referred to as ‘incremental innovation’ (Assink, 2006). A B2B example of this type of innovation is crane manufacturer ZPMC, which due to the low engineer wages in China, was able to tailor products for the target segment and keep prices low (Williamson & Zeng, 2009). In fact, these innovations are commonly based on exploiting a country-specific advantage of lower labour cost in production and R&D, thereby achieving an acceptable price-point, yet offering a similar product, where the functionality essentially remains the same (Williamson, 2010). Often this implies process

innovation along the supply chain, using standard components and cost-effective raw materials to the extent possible (Zeschky, Winterhalter & Gassmann, 2014b). Hence, it can be argued that cost innovations rely on existing products and technologies, serving an already existing market (Assink, 2006; Zeschky, Winterhalter & Gassmann, 2014a).

Second, some authors argue that the limitation of ‘cost innovations’ lies in the circumstance that companies equate the characteristics of a premium product with the market needs, therefore leaving out to consider what functionalities would be adequate to compete with incumbents (Christensen, 1997). In this line, ‘*good-enough*’ innovation has emerged, generally implying ‘value for money’ (Little, 2008; Jullens, 2013). For example, Volvo aimed at targeting the mid-segment construction industry by developing a ‘good-enough’ heavy truck, incorporating less complex and more easy-to-use technology, less equipment, and fewer horsepower, thereby making it much cheaper than the premium alternatives (Little, 2008). Hence, some authors argue that this type of innovation not only relies on stripping off unneeded features of existing product lines, but also incorporates new features (Zeschky, Winterhalter & Gassman, 2014a) (e.g. easy-to-handle technology), especially attractive for the local mid-segment (Gadiesh et al. 2007). ‘Good-enough’ innovations are also seen as an incremental innovation, but compared to ‘cost innovation’ are characterised by the company developing a product incorporating newer technology, for a slightly newer market (Assink, 2006).

Third, more recently the term ‘*frugal innovation*’ has emerged, referring to the ability to innovate with scarce resources (The Economist, 2010). Frugal innovation, or also called ‘breakthrough innovation’ (Assink, 2006), is regarded the “*pinnacle of innovation capabilities in resource-constrained markets*” (Zeschky, Winterhalter & Gassmann, 2014a, p.25), starting from a ‘clean-sheet’ or ‘bottom-up’ approach, instead of adapting an existing premium product (Sehgal et al., 2010). Hence, it implies working backwards, taking the needs of the below premium-segments as a starting point, making products affordable, robust and easy-to-use (The Economist, 2010). For example, Dutch Qiagen created a never-before-seen system aimed at rural medical centres detecting the human papillomavirus, by initially identifying the need for a portable and robust device entailing ease-of-use. The simplicity of it was so high, that even non-educated staff quickly understood its concept (Zeschky, Winterhalter & Gassmann, 2014a). This type of innovation hence implies a complete new solution to a problem, targeting a new market in the below premium-segment (Assink, 2006).

Last but not least, Christensen (1997) used the term '*disruptive innovation*' mainly in the context of developed markets, defining it as technologies that are less complex, while providing a more attractive value proposition than premium products of established market leaders (ibid.). For example, Rolltronics created a disruptive technology, by innovating a low-cost, environmentally friendly roll-to-roll semiconductor production process. Compared to the expensive and toxic process offered by incumbents, Rolltronics did not only provide a better and cheaper fabrication, it also became easier to locate the 'greener' production facility closer to the end-market (Hart & Christensen, 2002). Hence, disruptive innovations make products more accessible to consumers in terms of cost, but at the same time threaten market leaders (Christensen, 1997), thereby applying to all three above-mentioned innovation concepts.

Consequently, this review has shown that the abovementioned *innovations targeting the mid-segment in emerging markets* share some commonalities. First, they all provide a solution for the below premium-segments, until that point not served by Western MNCs. Second, the aim is to make a product affordable and accessible for the vast number of customers in the below premium-segments. Third, the offering can be based on an existing product, a novel solution, or a combination of both, whereas common characteristics such as an affordability, quality, robustness and ease-of-use, while offering the same basic functionality, have major importance. Last, all three innovations, whether it is a 'cost-', 'good-enough-' or 'frugal' innovation, can display disruptive potential. However, as outlined in Figure 2.3 below, the innovations can be distinguished based on the degree of market novelty and technological novelty involved (Ansoff, 1965), which implies differing levels of R&D effort (Zeschky, Winterhalter & Gassmann, 2014b), and varying degrees of risk connected to the speed of market acceptance, and the financial investment incurred (Assink, 2006). Hence, in terms of 'cost'- 'good-enough'- and 'frugal' innovation, the product development investment and risk increases with the respective innovation, whereby the latter requires the highest level of market and technology research.

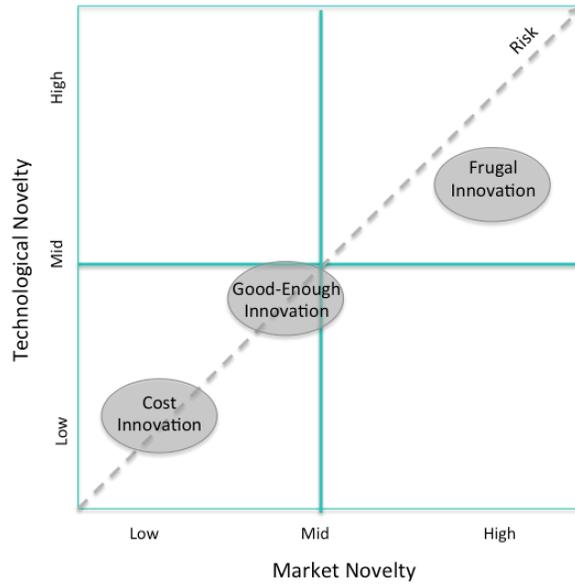


Figure 2.3 Market- and Technological Novelty, and the Degree of Financial- and Market Acceptance Risk. Compiled by authors, based on Ansoff (1965), Assink (2006) and Zeschky, Winterhalter and Gassmann (2014b).

However, it must be mentioned that most of the discussed innovations are in fact based on already existing products or solutions. Therefore, to create such innovations, several studies found that granting access to existing technological know-how within the MNC is an important factor to stimulate this type of innovation and prevent from reinventing the wheel (Govindarajan & Trimble, 2009; Zeschky, Winterhalter & Gassmann, 2014b). However, in terms of ‘frugal’ innovations, it can be argued that granting ‘too much’ access to the HQ’s technological know-how can inhibit a successful development. That is, as simply reusing technologies from the premium products is deemed to work against frugality (Sehgal et al., 2010).

### 2.2.2.3 Value Chain – How to Organize the Development Process

Most of the literature discussed so far focuses on the product side of innovation, referring to affordable, high-quality, robust, easy-to-use solutions that make a product accessible for resource-constrained customers of the below premium-segment. However, to successfully create this type of ‘*innovations targeting the mid-segment in emerging markets*’, companies have to go beyond only innovating on the product side (Chakravarthy & Coughlan, 2011; Soni & Krishnan, 2014; The Economist, 2010). Instead, a more holistic view on innovation need be applied, rethinking the organizational structure and entire business model, including production processes, cost models and value propositions (Assink, 2006; Chakravarthy & Coughlan, 2011; Soni & Krishnan, 2014; The Economist, 2010; Zott et al., 2011). Hence, this type of innovation goes

beyond the traditional product development responsibilities of the R&D unit, as it calls for a close cooperation and collaboration between different business functions and its value chain (Assink, 2006; Prahalad, 2012) in order to establish a sustaining competitive advantage and be able to fully commercialise the solution (Chakravarthy & Coughlan, 2011; Eyring et al., 2011; Zott, et al., 2011).

Therefore, this element of the business model intends to clarify how activities and processes have to be organised, to deliver the defined value proposition to the customer. This includes all value chain activities, the planning of resources required, the definition of the required capabilities, and managing the communication and knowledge flows between them (Gassmann et. al., 2013). In this line, availability and awareness have been identified as major hindrances to overcome when serving emerging markets, as infrastructural concerns force companies to adapt their delivery models and distribution channels (Anderson & Billou, 2007; Chakravarthy & Coughlan, 2011; Little, 2008; Prahalad, 2012). The question how to reach the customers both in terms of marketing channels to create awareness, and to physically deliver the product or service becomes a whole new dimension to bear in mind when targeting resource-constrained customers of the below premium-segments, as traditional channels might not be available or fragmented (Anderson & Billou, 2007; Eyring et al, 2011; Little, 2008). Second, one of the most important components of innovating solutions for resource-constrained customers in emerging market is affordability (Anderson & Billou, 2007; Eyring et al, 2011; Shankar & Hanson, 2015). This means that Western companies cannot rely on their traditional practice of selling technologically advanced solutions at a price premium, relying on high-margins, but rather they have to rethink their revenue model by creating cheaper solutions for the masses (Christensen, 1997; Zeschky Winterhalter & Gassmann, 2014a). However, this is often offset by the enormous volumes and growing purchasing power already discussed before (Eyring et al., 2011). Hence, successful innovations create a value proposition that improve the price performance ratio dramatically (Prahalad, 2012). This is crucially interlinked with producing and sourcing locally, which gives companies the opportunity to take advantage of the lower labour costs found in emerging markets and thereby sometimes completely reinvent their existing cost structures (Gebauer, et al 2009; Prahalad & Hart, 2002). Moreover, Western MNCs ought to improve operational excellence across the entire value chain, and thereby further reduce the cost, to compete with the established local competition (EY, 2011; Gadiesh et al., 2007; Jullens, 2013; Sehgal et al., 2010). Another

positive aspect of relocating production to the emerging markets, is the increased proportion of local employment, which enhances the acceptance among political and social stakeholders (Prahalad & Hart, 2002). An example of how companies organise their value chain according to the mid-segment characteristics is given by Indian Godrej & Boyce, as they were aptly able to confront the infrastructural challenges in rural India. This, as their 'ChotuKool', a small, and less complex micro-refrigerator, was much easier to distribute physically. Also, they hired and trained local villagers as salespersons, ensuring high awareness and access to the target market, and significantly lowered marketing and distribution costs (Chakravarthy & Coughlan, 2011).

#### 2.2.2.4 External Environment

This element highlights the fact that the subsidiary is embedded in the local market, establishing valuable external relationships with institutions, universities, customers, suppliers and competitors. In this line, literature points that political and social support tremendously gains in importance when operating in emerging markets, as local institutions and social contracts are generally of more value than formal documentation (London & Hart, 2004; Prahalad & Hart, 2002). Therefore, relationship building with NGOs, local, regional and national governmental institutions, the local community and other stakeholders is seen as an important aspect to build an underlying network to increase acceptability and establish a better connection to the relevant target market (Jullens, 2013; Prahalad, 2006; Prahalad, 2012), as well as tapping into the local knowledge of the foreign market (Kuemmerle, 1997). For example, Hewlett-Packard entered a partnership with state-owned China Telecom, whereby new broadband subscribers were offered free laptops. This increased their access to the resource-constrained customers in the rural parts of China, and therefore also acceptability to such a high extent, that Hewlett-Packard became the second largest market shareholder in the country (Gebauer et al., 2009).

To conclude, it must be highlighted that creating highly adapted products and new business models targeting resource-constrained customers of the below premium-segments, lead to additional organizational and managerial challenges, as the company has to operate two different business models or more for the same geographic region (Winterhalter et al., 2015). The present literature on this topic suggests the set-up of a separate organizational unit managing this type of innovations in order to overcome the challenges and risks connected to the mid-segment (e.g. Gadiesh et al., 2007; Gebauer et al., 2009; Immelt et al., 2009). These are advised to be treated like a new organization, clearly separated from the Western MNC's core processes, and which

are given complete autonomy in developing their own strategies, organizations, and products (Immelt et al., 2009). By doing so, the separate, independent business units are able to more successfully conduct extensive market analysis and attain location specific knowledge (Gadiesh et al., 2007; Gebauer et al., 2009; Immelt et al., 2009). This in turn, leads to a stronger ability to clearly separate the mid-segment product form its premium counterpart, thereby reducing the risk of cannibalisation (Gadiesh et al., 2007).

### 2.3. The Conceptual Framework

The following framework is derived from the literature review and is conceptualised by unifying important parameters from each section discussed previously. As outlined in Figure 2.4 below, it consists of three main parts: First, the underlying organizational structure and the HQ subsidiary relationship. Second, the innovation process itself, exemplified as a collaboration within the internal and external R&D network, where knowledge is accumulated over time. And third, the characteristics of the target segment and the product offering. In the following, assumptions and expectations of each of the three elements of this conceptual framework are explained in more detail.

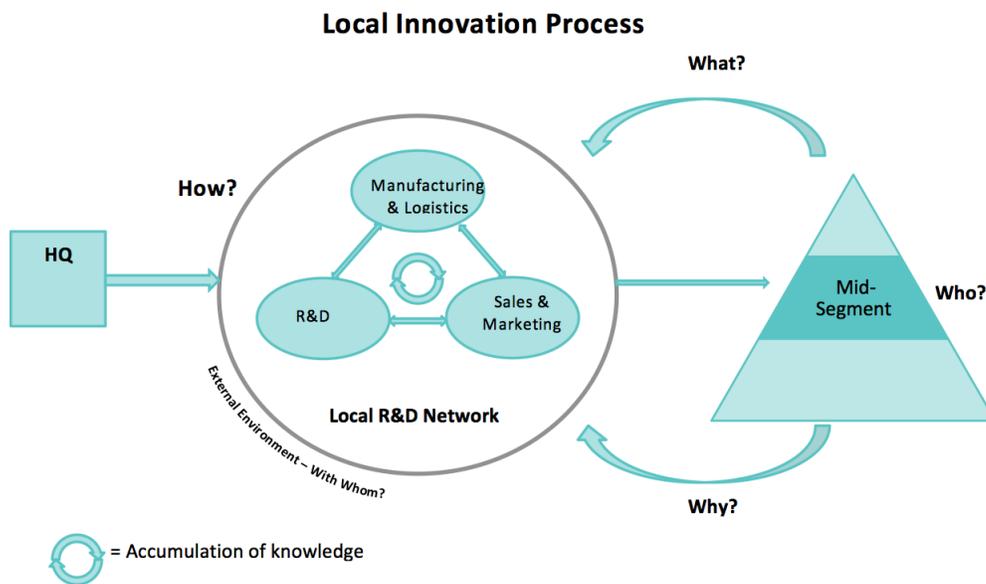


Figure 2.4 Conceptual Framework. R&D. Compiled by authors

This framework rests on the key assumption that the local R&D unit plays a key role when innovating products targeting the mid-segment in emerging markets (Zeschky, Widenmayer & Gassmann, 2014), as this type of innovation requires a high-degree of local knowledge and a

deep understanding of the target segment and its preferences. Following Kuemmerle's (1997) concept of a home-base exploiting subsidiary, it is believed that most of the development effort incurred in the local R&D unit is more connected to the development side, whereas the applied research is carried out by the central R&D unit located at the HQ in the Western home country. Additionally, the majority of innovations, successfully targeting the mid-segment, are based on existing technologies held by the central R&D unit (Cantwell & Mudambi, 2005; Govindarajan & Trimble 2012). Therefore, the arrow between the HQ and the local subsidiary exemplifies the influence of the HQ by sharing knowledge with the local R&D unit during the development process. In this line, it is expected, that increased trust from the HQ subsequently leads to more activities being transferred to the emerging market subsidiary. Thus, the conceptual framework supports the arguments of e.g. Immelt et al. (2009), Jullens (2013), and Govindarajan and Trimble (2009), regarding that Western MNCs must create a strategy and business model, for the mid-segment in emerging markets and thereby arguing for a higher degree of autonomy for the local mid-segment unit. This often implies setting up a separate organizational unit, sometimes even operating under a different brand name (Immelt et al., 2009). Hence, it is expected that with increased trust and autonomy awarded to the local subsidiary, the HQ influence will decrease when developing products targeting the mid-segment.

The product development is a complex process involving various actors and stakeholders. It is believed that successfully innovating for the mid-segment in emerging markets, requires to not only innovate on the product side, but also on the process side, rethinking the entire business model and underlying organizational structure, following the assumptions of e.g. Assink (2006), Chakravarthy & Coughlan (2011) and Eyring et al. (2011). The R&D effort is therefore seen from a network perspective, as an accumulation and use of knowledge comes from various sources of input; more specifically R&D, Sales & Marketing, and Manufacturing & Logistics, in line with Trott (2012). Consequently, the innovation process is seen as a collaborative effort between key functions along the value chain, following Assink (2006), whereas it is expected that the collaborative effort intensifies when developing products for the local mid-segment. This is exemplified by the central element of the framework, the local subsidiary and its local R&D network. Additionally, the local external environment is exemplified by the circle surrounding the subsidiary, as this study follows the suggestions of Jullens (2013) and Prahalad (2006) that external relationships with local customers, institutions and suppliers gain in importance in

emerging markets. Accordingly, it is expected to find evidence of increased external collaboration with local partners during the development process, as postulated by Trott (2012) applying a network view on the R&D effort.

Further, it is believed that the specific characteristics of the mid-segment influence how the innovation process is organised, and which roles are taken by different departments along the value chain, which is exemplified by the elements on the right side of the framework (i.e. Who?, What? and Why?). It is assumed that to successfully innovate for the mid-segment, the core questions of a business model of how to deliver, produce, market and sell a product, will substantially differ from the premium-segment. Therefore, this conceptual framework does not entirely forego the fact that the type of innovation itself has an effect on the development process. This is especially building on the notions of e.g. Zeschky, Winterhalter and Gassman (2014b) and Assink (2006) connected to that the degree of technical and market novelty have an effect on the market acceptance- and financial risk and thereby also on the level of the R&D effort. Hence, it is believed that the organisation of the development process might require a different set of capabilities depending on the degree of market novelty and technological novelty. As mentioned earlier, this study follows the notion of Gebauer et al. (2009), Hart & Christensen (2002) and Jullens (2013), who argue that, in order to develop perfectly tailored mid-segment solutions, this type of innovation requires a deep understanding of the specific needs of this segment. Therefore, it is expected that the effort of market research will increase, as assumed by Gebauer et al. (2009), and the use of local employees and fieldwork at customer sites will facilitate this type of innovation, as supported by Immelt et al. (2009) and Eyring et al. (2011).

Concluding, the conceptual framework incorporates every aspect of a business model, whereby the Why? and the Who? incorporates the current market situation and the characteristics of the emerging market mid-segment, triggering the innovation process. The What? refers to the value proposition, wherein the innovation type and its degree of market and technological novelty is assumed to have an effect on the development process. Last, the emphasis of this study and also the conceptual framework regards the How? of the business model. This includes the development process as a collaboration along the value chain within the local subsidiary, local external collaboration, and the initiatives taken by the HQ, having an effect on the role of the local R&D unit.

## 3. Methodology

*This section outlines the methodological approach chosen to conduct this case study. Hence, it provides a detailed description of the strategies and techniques utilised to gather the data, including measures to uphold its quality.*

### 3.1 Research Approach

As the aim is to create an understanding of how the Western MNC organises to develop innovations for the mid-segment in emerging markets, this study delves into the research unit Bühler Bangalore, thereby including the views held by the actors involved in the development on a deeper level. Therefore, a qualitative approach is deemed appropriate to live up to the goal and research question of this study, as it emphasises how individuals interpret their social world (Bryman & Bell, 2015), and thereby gives the researcher the opportunity to create a rich description (Merriam, 2002) of relationships, implicit assumptions, operational definitions and abstract concepts (London & Hart, 2004). This therefore also corresponds to the desire to create a more holistic view of the subject. Further, as the research aims to cover the topic of *how* a contemporary phenomenon is constructed within an organization, which is affected by the actions of its members and the setting in which the unit is active, a single case study approach is selected (Ghauri, 2004; Yin, 2014). That is, as the method opens up for a deeper understanding and description of a contemporary event shaped by the context in which it takes place (Yin, 2014). Therefore, this qualitative single case study includes on-site qualitative interviews with knowledgeable and experienced managers, holding key responsibilities in the development process of the two reviewed mid-segment innovations. In addition, as theory is limited in creating a holistic view of the way Western MNCs organise to develop innovations targeting the mid-segment, this study is of an explorative nature thereby delving into a rather new area of research. This rather exploratory approach is hence deemed to further strengthen the choice of conducting a qualitative single case study, as it opens up for a deeper description serving as a basis for future, more comprehensive studies (Ghauri, 2004; Merriam, 2002).

#### 3.1.1 Abductive Approach

This study originated from the idea to investigate the co-location of R&D, production and sales in the MNC and which role the subsidiary takes in developing new products. In the search for a more specific topic within this setting, recent literature on innovation concepts such as ‘cost’,

‘frugal’, ‘good-enough’, ‘disruptive’, and ‘breakthrough’ innovations was reviewed, wherefrom the research question emerged to investigate how MNCs organise to generate successful innovations targeting the mid-segment. As it still called for taking into account organizational factors and viewing this type of innovation from a business model perspective requiring the involvement of all departments along the value chain, it was incorporated in the literature review and conceptual framework. Subsequently, empirical questions were derived based on the conceptual framework, serving as the *‘theoretical blueprint’* (Yin, 2014) guiding the empirical data collection and analysis. This type of approach strongly correlates with a *deductive process* whereby the research has its starting point in existing theories, which is to be applied to, and tested in reality (Bryman & Bell, 2015). Yet as the conceptual framework not only served to guide the collection of empirical findings, it was also critically reflected upon throughout the multiple interviews and gathering of relevant data, it implies that rather than being exclusively deductive, this study involves an iterative process. This entails that during and after the data collection the researcher went back to the theory, reviewing if all parts of the proposed framework are actually covered by the semi-structured questionnaire, while ensuring that all relevant parts of theory were included in the literature review. Hence, this form of reorganising and adapting the theory as the study was carried out is referred to as *inductive reasoning*, where the theory is subsequently built on the findings. Consequently, the overall approach of this paper, goes in line with the fact that most researchers conducting qualitative case studies tend to vary in their approach to theory generation and testing and therefore uses an *abductive* approach, combining deduction and induction (Bryman & Bell, 2015). To sum up, this study has throughout the research process continuously revisited theory, readapted questions based on new insights, which subsequently ended up in a revisited conceptual framework.

### 3.2 Research Unit and Design

The unit of analysis for this case study is the local subsidiary of a Western MNC, i.e. Swiss Bühler. The arguments supporting the relevance of Bühler Bangalore as a single case study unit are manifold.

First, Bühler is a market leader in producing equipment and technologies for the food processing industry, holding impressive global market shares amounting to as much as 65 percent of the worldwide wheat being milled on their technologies (Bühler, 2016a). Until recently, the company was mostly present in the top-ends of these markets, offering high-capacity machines to a rather

small premium-segment. Second, Bühler has a long history in Asian Markets, and though there is evidence that products have been specifically developed for the mid-segment in these emerging markets, the company is still at its early stages of entering the below premium-segments. Hence it is currently adapting its R&D hub and spoke system into a global R&D network to spur innovations for the mid-segment in emerging markets. In this vein, the role of Bühler Bangalore as a major R&D site serves as an ideal unit of analysis to gain insight of the organizational parameters necessary for this type of product development. Third, instead of limiting the case study to the innovation process of only one product targeting the mid-segment, this study offers a comparison between two: the Mini-PESA Mill and the SmartLine Rice Processing Machines. By comparing the development process of these two products, a richer understanding of the factors to develop mid-segment innovations is provided. It can also be better distinguished which parameters are more attributable to the development process and which are connected to the organizational structure. Further, this case study design offers the possibility of outlining differences between the development process of a premium- vis-a-vis a mid-segment solution, as both products have premium predecessors.

### 3.2.2 Data Collection and Sampling

In order to gather empirical data of relevance for the purpose and research question of this study, various sources have been used. Beneficial to utilising a qualitative single case study as research approach, is a broader access to both secondary and primary data sources within the organization, such as internal documents, organizational charts, key interviewees, and departments (Bryman & Bell, 2015). Therefore, the study was carried out in India, visiting the site of Bühler Bangalore for a duration of two weeks, to conduct on-site interviews with local managers who are the best and most relevant sources of knowledge when investigating a phenomena evolving from the local subsidiary. This approach thus ensures that the empirical data gathered during the study is comprehensive, and relevant for the question under research.

#### Primary Data

In order to identify key actors involved in the process of creating innovations targeting the mid-segment, relevant organizational functions were identified based on the conceptual framework, available organizational charts from Bühler, and project-team charts from the mid-segment products. As such product development involves several actors of multiple layers of the organization, it was of importance to not only include insights from as many local key managers

as possible, but also from actors representing lower levels within the organization, and departments only marginally involved in the development. Further, although this study emphasises the local subsidiary perspective, members of the HQ were also included to the extent possible. Based on these parameters, a list of key functions to interview was sent a priori to the contact person at the Corporate Technology department at Bühler Bangalore, which served as the starting point of the primary data collection within the global R&D network of Bühler. As the researchers' familiarity and knowledge of the organization, its development processes, relevant actors, and departments increased, new interview subjects were identified and selected, which is referred to as generic purposive sampling (Bryman & Bell, 2015). Consequently, this completed the picture and thereby also served to create a holistic view of the phenomena, through including the perspectives of nearly all departments involved in the development processes (See Table 3.1), including members of the HQ and two expats (see shaded areas in Table 3.1 & 3.2). In addition to the internal interviews conducted at Bühler Bangalore, external perspectives added to the primary data. These interviews were held with the Indo-German Chamber of Commerce (IGCC) and Business Sweden, two governmental organizations with extensive knowledge of the Indian market. These were considered highly beneficial for the empirical findings, providing a 'third party' perspective on the characteristics of the mid-segment in India, the challenges for Western MNCs targeting this segment, and further insights on the competitive climate with the rise of strong local competitors.

As Table 3.1 illustrates below, 15 interviews were conducted, of which 13 were held with interviewees from Bühler, including the Bangalore chief executive officer (CEO), R&D managers, managers of other departments and lower level engineers involved in the development process, as well as two interviewees representing the HQ perspective. Last, two external third party interviews round up the picture. The big majority of the interviews were held face-to-face, whereas two of them were conducted via online conference calls, and all interviews lasted approximately 1 hour each.

Manager	Organizational Unit	Area of Responsibility	Location	Type of Interview	Manager	Organizational Unit	Area of Responsibility	Location	Type of Interview
A	Corporate Technology	Managing Director EPFL Innovation Satellite & Director Corporate	Lausanne EPFL Innovation Satellite/ Bühler	Skype Conference Call	J	Supply Chain/Manufacturing	Manager Export Platform and New Product Introduction	Expatriate at Bühler Bangalore	Face-to-face
B	Corporate Technology	Team Leader	Bühler Bangalore	Face-to-face	K	Customer Service	Head of Customer Services	Bühler Bangalore	Face-to-face
C	R&D	Global Product Manager Rice Processing South Asia, Middle East and Africa	Bühler Bangalore	Face-to-face	L	R&D	Head of R&D Unit Rice & Pulses	Bühler Bangalore	Face-to-face
D	Corporate Technology	Head of Corporate Technology	Bühler Bangalore	Face-to-face	M	Market to Market	Product Designer	Bühler Bangalore	Face-to-face
E	Marketing	National Manager, Marketing and Business Development	Bühler Bangalore	Face-to-face	<b>External</b>				
F	HR	Head of HR and Admin	Bühler Bangalore	Face-to-face					
G	Market to Market	Head of Market to Market	Bühler Bangalore	Face-to-face	N	Indo-German Chamber of Commerce	Regional Director	Bangalore	Face-to-face
H	Sales	Group Manager, Head of Grain Milling	Bühler Bangalore	Face-to-face	O	Business Sweden Bangalore	Manager	Bangalore	Face-to-face
I	Management	CEO Bühler Bangalore	Bühler Bangalore	Skype Conference Call					

Table 3.1 List of Interviews

Furthermore, as outlined in Table 3.2 below, five informal discussions with respondents possessing relevant knowledge contributed to the collection of the primary data through a deeper contextualisation of the case unit. This includes, for instance, the walk through the Bühler Bangalore premises on the first day, visiting the manufacturing workshop, and seeing the two mid-segment products in the application centre. Further, this also opened the possibility to take into account an informal discussion with the CEO of Bühler Group during his visit in Bangalore, contributing to this study by providing an overall perspective from the highest hierarchical level in the organization. Last, complimentary round up discussions were held with managers for finishing clarifications, and in order to include supplementary HQ perspectives through the opportunity to hold a discussion with one additional expat (see shaded area in Table 3.2 below).

	Organizational Unit	Area of Responsibility	Location	Type of Discussion
P	Corporate Technology	Head of Corporate Technology	Bühler Bangalore	Face-to-Face
Q	Corporate Technology	Team Leader	Bühler Bangalore	Face-to-Face Location introduction, walkaround
R	Board of Directors	CEO Bühler Group	Bühler Uzwil	Speech and Face-to-Face
S	R&D	Head of R&D Unit Value Nutrition and Business Area Consumer Food	Expatriate at Bühler Bangalore	Face-to-Face
T	R&D	Head of Business Unit Rice Processing	Bühler Bangalore	Face-to-Face

Table 3.2 List of Informal Discussions

## Secondary Data

In addition to the primary data, secondary empirical data was collected throughout the research process. As aforementioned, the sources used for collecting that kind of data are for instance internal documentation and presentations, annual reports, product information sheets and external documentation. When conducting case study research, multiple sources of research are advised to be utilised (Collis & Hussey, 2009) as it serves to ensure high quality of the study itself (Yin, 2014). Not only did a preceding collection and interpretation of secondary data serve to enhance an initial understanding of the context in which the case study unit is active, it also benefited the researchers' ability to ask the 'right' questions during the interviews. This in turn, ensured richness of the data collected, and thereby also the quality of the subsequent analysis. Hence, secondary sources were utilised to support the primary data, i.e. what was said during the interviews.

### 3.2.3 Interview Process

In order to meet the aim of this study to provide an in-depth understanding of the case study unit, a semi-structured interview approach is considered most suitable (Collis & Hussey, 2009). Specifically as the interview remains relevant, yet opens up for uncovering unpredicted areas of interest through un-predefined questions (Bryman & Bell, 2015). In this study, a semi-structured interviewing technique was especially pertinent, as it allowed for encouraging the interviewees to exemplify situations through storytelling. This served to enhance the understanding of complex phenomena, such as the development process and its implications on other departments. Furthermore, this technique is in line the chosen research strategy, the abductive approach. That is, as the literature review and conceptualization served to determine predefined questions, and as new, unexpected empirical findings opened up for changes in the conceptual framework. An interview guide was also developed beforehand with regards to the framework, which was somewhat tailored to each department, and especially for the 'third-parties' (see Appendix 1 A & B). The questions were not shared with the interviewees in order to ensure that they had an open mind and to mitigate prepared and biased answers. However, they were provided with the research topic, and at the beginning of each interview were asked to explain their understanding of what is referred to as the 'mid-segment', to make sure the answers correspond to the topic. In addition, each interview was recorded, thereby ensuring that the researchers could go back to the interview and not oversee any important information. This further served to facilitate a detailed analysis on a later stage (Bryman & Bell, 2015). Last, the outcome of each interview was

subsequently reflected upon and transcribed by the researchers. This served to enhance the interview guide throughout the data collection, as new questions were included if deemed to add value to the primary data or reformulated if proving to be ineffective.

### 3.3 Organising Data for the Analytical Process

In order to correctly interpret the vast extent of data that was collected throughout the empirical fieldwork conducted on-site in India, each interview was transcribed and discussed during the stay in Bangalore to have a fresh insight about the data retrieved. The findings were thereafter organised into a matrix table using excel, creating a column for each interviewee specifying the organizational function and the responsibility during the development process for each product under review on the top, while then subsequently using the lines to cluster the answers into the main parts of the conceptual framework. Yet, by using categories for organising the data, Marshall (1981, as cited in Bryman & Bell, 2015, p.398) holds that the researcher may miss out on important information due to the case losing its 'wholeness'. This was taken into account by opening a category for answers initially not fitting into any category of the conceptual framework, thereby avoiding a potential loss of information and remaining a holistic view of each case (ibid.). Further, by organising the data in the above explained matrix manner, it was also possible to filter the findings according to the function, and product. Based on this profound analysis, a revised conceptual framework evolved, supporting the chosen abductive research approach.

### 3.4 Ethical Considerations

To ensure that the study has been conducted with rigour, thereby ensuring the quality of its findings, Guba and Lincoln (1994) highlight four quality criteria relating to reliability and validity. Hence, these criteria refer to the trustworthiness of the findings (Bryman & Bell, 2015; Guba & Lincoln, 1994) and have been considered thoroughly throughout the process of conducting this study. The strategies used to uphold the trustworthiness and quality of this study are hence outlined below;

First, *Credibility* is relating to internal validity (Guba & Lincoln, 1994) and thereby how well the findings match the reality of what is being researched (Collis & Hussey, 2009). This was upheld as the findings were compared, confirmed, and triangulated with the subsequent interviews, secondary sources and internal documentation. The researchers also sent the draft of the findings to the members of the study for validation whereby findings were revised in case of

misinterpretations, thereby ensuring that the findings correctly represent the social world in which they are active (Bryman & Bell, 2015). Further, in order to ensure that the findings correctly represent the views of both the subsidiary and the HQ, the researchers sent the study to members of both units for validation. Second, *Transferability* relates to external validity (Guba & Lincoln, 1994) and therefore the generalisability of the findings. Hence, it refers to how well the findings can be applicable to other social settings. With regards to the delimitations stated in section 1.4, it is of importance to bring with that this study is in fact, limited to the context of the research unit (i.e. Bühler Bangalore). Yet, generalisability can transfer well given that the analysis correctly has grasped the phenomena under study through having a comprehensive understanding of its context beforehand (Collis and Hussey, 2009). Through an introductory presentation and prior knowledge of the Bangalore unit, contextualisation was made and described in the highest detail possible in this study in order to ensure higher transferability. Third, *Dependability* parallels reliability (Guba & Lincoln, 1994) and therefore the degree of which the study can be replicated at a later stage (Bryman & Bell, 2015), whereby the same findings are collected (Yin, 2014). Hence, extensive documentation of the data collection processes was kept, including interview transcriptions, procedures, etc. to ensure dependability and therefore authenticity of the findings (Bryman and Bell 2015; Yin 2014). Last, *Confirmability* relates to the objectivity of the researchers (Guba & Lincoln, 1994), thereby lowering the possibility of findings influenced by a potential bias (Bryman & Bell, 2015). The objectivity of this study has been ensured to the highest extent possible through interviewee validation as well triangulation of the collected data. Additionally, the fact that the researchers had no prior knowledge or relationship with the case study unit, as well as the compressed, but intensive, amount of time frame of the study of only two weeks on-site, could also be argued to have lowered an initial bias tied to the knowledge of the organization of study.

## 4. Empirical Findings

*This section presents the empirical data gathered. After a short introduction to Bühler group and its existent R&D network, Bühler’s current presence in the Indian mid-segment and its characteristics are outlined. This is followed, by providing insights on how the identified characteristics influence the development process, and how the process for the two mid-market innovations under review differed from the standard process. The chapter ends by presenting the implications for other departments along the value chain.*

### 4.1 Introduction to Bühler Group

Bühler is a leading Swiss technology company headquartered in Uzwil (Switzerland) producing manufacturing equipment and processing technologies for the food industry, and technological solutions in the field of die casting and surface coating. The company employs over 10.800 people worldwide, amounting to a consistent annual turnover of 2.4 billion CHF in 2015 (Bühler, 2016a). Bühler was founded as a cast iron foundry in 1860, producing its first complete roller mill in 1876 and since then has been driven by innovation, quickly opening offices in Paris in 1891 and New York in 1924. Today, the company is present in 140 countries, operating 27 production sites worldwide, dividing its portfolio between two main business areas: Grains & Foods and Advanced Materials. In 2015, the strongest of the eight businesses units, outlined in Figure 4.1 below, were Grain Milling, Value Nutrition and Die Casting contributing respectively with 29, 21 and 12 percent to annual turnover. The business unit Sortex & Rice ranks fifth with 9 percent of annual turnover the same year.

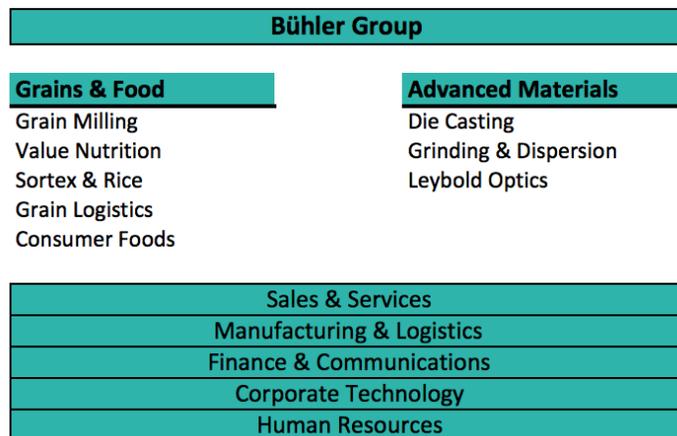


Figure 4.1 Bühler Organizational Chart (Source: Bühler, 2016b)

The social impact of this economic success is evident considering that an exceptional amount of 65 percent of the worldwide wheat and 30 percent of the global rice being produced using Bühler mills and rice processing machines. Therefore billions of people around the globe come into daily contact with Bühler technologies fulfilling their basic needs for safe and high-quality food (Bühler, 2016a).

In terms of regions, Asia contributed with 33 percent to annual turnover in 2015, whereas 7 percent was assigned specifically to South Asia, including India, Bangladesh, Sri Lanka, Nepal and Bhutan (Bühler, 2016a). Bühler entered India in 1992, by establishing a production facility with a small sales-office through a Greenfield investment in Bangalore, which was inaugurated only one year later. Business took off in the early 2000s when Bühler bought out the local joint venture partner, making Bühler Bangalore a fully owned subsidiary. Since then, Bühler Bangalore expanded its local sales and service network, nowadays employing more than 550 people providing the best solutions for the local market through five regional offices in New Delhi, Kolkata, Pune, Hyderabad and Raipur, and more than 20 service stations across the country. Bühler Bangalore's main business units are Sortex & Rice and Grain Milling, whereas the remaining part is attributed to Value Nutrition and Advanced Materials (Manager D).

## 4.2 Organizational Factors Facilitating Local Innovation

The following section will outline how Bühler organises its global R&D network to facilitate this type of local innovation targeting the emerging market mid-segment. Hence, the structure of the conceptual framework is followed, which can be seen in Figure 4.2 below.

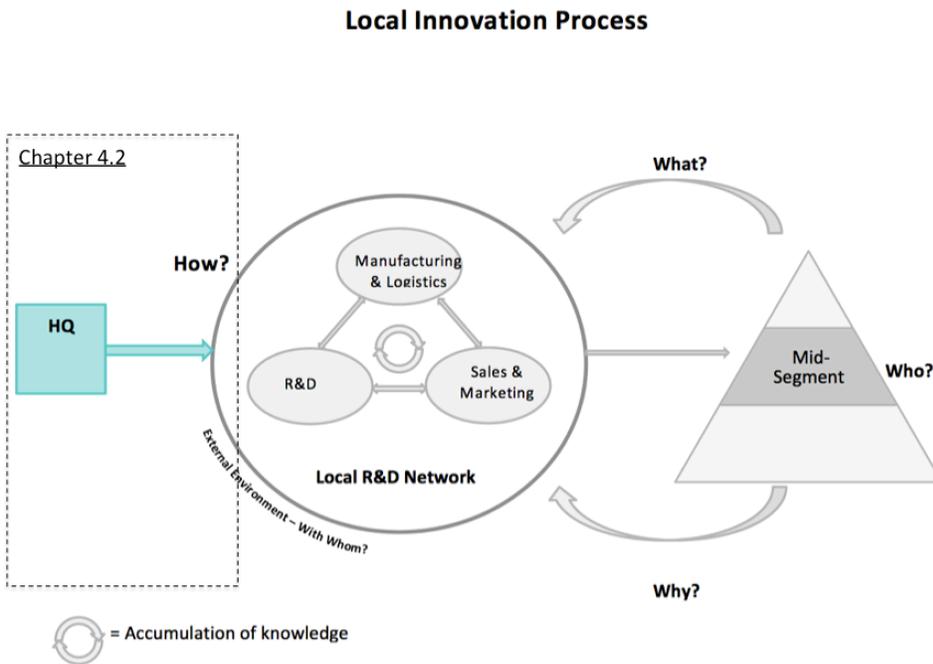


Figure 4.2 Overview of Chapter 4.2. Compiled by authors

As a leading market incumbent with the mission of ‘*engineering customer success*’ Bühler spends as much as 5 percent of its annual turnover on R&D activities, clearly signalling its focus on innovation (Bühler, 2016b). Bühler’s operates a global R&D network for ‘Open Innovation’, decentralising its R&D network and establishing innovation and application centres close to relevant target markets and running yearly supplier- and in-house innovation challenges (Bühler, 2016b). Additionally, in March 2015 Bühler inaugurated an innovation satellite at the University of Lausanne (EPFL), to specifically tap into the knowledge of students, spot new trends and stay at the forefront of innovation. This network approach on R&D, helps Bühler to further capture the knowledge of local employees, customers, universities, suppliers and other partners, in order to develop more customer-centric solutions, derived from local market needs (Bühler, 2016b). In this line, Bühler has recognised the opportunity embedded in the huge mid-segment of emerging markets, and over the past years has intensified its efforts to develop more affordable, robust and easy-to-use region-specific solutions (Bühler, 2014). Consequently, several products have been

launched, for example a corn-mill for the African market transportable in only two containers developed in collaboration with NGOs, the Mini-PESA mill for Atta flour and rice processing equipment for the Indian market (Manager A).

Traditionally, Bühler kept the central R&D function of the eight business units within their main sites in Europe. However, alongside with the company's policy to innovate *'in the region for the region'*, Bühler has re-located several R&D functions closer to the target markets. Looking at the development of Bühler Bangalore, the HQ's confidence in the Indian subsidiary was proven in 2008 by transferring the global Rice Milling R&D unit from Braunschweig (Germany) to Bangalore (Managers D; L). This is a big step, as it is the first business unit where the global R&D lead is completely transferred to an emerging market. These business unit R&D teams focus on incremental innovations of existing products and solutions, while conducting research on new technologies and recipes, hence, performing the traditional role of R&D. For all other business units, where the central R&D is still held in Europe, most technological research is carried out close to the HQ, whereas the local R&D units as Bühler Bangalore focus on product development. Hence, there is clearly a differentiation to be made between research projects and development projects, whereas the line is not always easily drawn (Managers D; G; J). More recently, following this route of decentralising and creating a more regionalised R&D footprint, an important decision was taken at the beginning of 2015, when the R&D competencies for rice were split between China and India, Bühler Bangalore now being responsible for South Asia and Middle East and Africa, whereas China holds the responsibility for the South-East Asian market, and the global market (Manager C).

With the mandate to accelerate local innovation, the corporate technology (CT) department was decentralised in 2012, building up local teams in Uzwil (Switzerland), Minneapolis (US), Wuxi (China) and Bangalore (India) (Manager D). These cross-organizational teams belong to a matrix organization and directly report to the local CEO, and the chief technology officer (CTO) at the HQ. Further, they collaborate closely with the 'traditional' R&D departments, namely the R&D business unit explained above, and the Market-to-Market (M2M) department, which takes over the role of adapting the designed solutions to local requirements, and cover all the processes to prepare it for launching. The core difference of CT vis-a-vis the R&D business units and the M2M team, is that CT has an extended focus on the mid-segment and on technology-based innovation (Managers D; G), as Manager G explains *"CT is clearly from customer to technology,*

*not on the product development.*” R&D and M2M focus more on design and development, than on pure idea generation. Further, CT does not possess the same capabilities as M2M (Manager G). This means that CT may lead a project during business plan and conception phase, whereas pure development and design is executed by M2M or R&D. Hence, the core function of CT during the standard M2M process is to identify and validate local market opportunities, develop a proof of concept and thereafter consign it to M2M or R&D for development (Managers B; D; G). Another major step to increase Bühler Bangalore’s innovation competencies and autonomy was the establishment of the application centre in 2010, serving as a regional innovation laboratory and training facility, offering customers and clients the possibility to test new products and recipes on Bühler machines (Manager A; Bühler, 2016b).

These steps, initiated by the HQ, clearly show the gradual decentralisation of R&D functions, to move closer to the local markets, and in fact, several managers in Bühler Bangalore agree upon that there is a great deal of autonomy and trust granted to the subsidiary. With increased local capabilities, more innovation mandates are transferred from the HQ to the subsidiary, thereby emphasising the use of local management to enhance region-specific products (Managers B; D; G; F; I; J). However, it must be highlighted that the HQ still has a strong presence. For example, stronger HQ support and control takes form in the local business units where sales have yet not taken off. This is recognised in the Bangalore unit, as Manager D explains: *“When business volumes are small, you have to listen more to the headquarter, they have more say. There is no justification for you to stand up and show that you need to do something else.”* However, this authority seems to evolve into trust and autonomy as local knowledge increases in correlation with sales volumes. Again, Manager D: *“As you attain critical mass, they start listening to you.”* In addition, the HQ provides support in areas where knowledge is not fully established. A clear example is their use of expats when establishing new operations. One expat was sent from the Uzwil HQ to Bangalore when establishing the global export platform, to ensure that local operations were set up successfully. As Manager J explains *“Expats will be delegated to set up something new, as I did for the export platform.”* However, this support is not long-term, as local successors are educated to take over the responsibility after a successful establishment is ensured (Manager J).

Consequently, the gradual decentralisation of the global R&D function, the building of local teams, in combination with increased autonomy and trust from the HQ, has enhanced the

innovative capability of Bühler Bangalore as a subsidiary (Managers B; D; F; G; I). In fact, according to Manager I, autonomy and use of local knowledge are main reasons for why the Indian subsidiary has been so successful in developing local innovations: *“You can’t sit [only] in Switzerland and develop products or processes for that specific market, because we are in the food industry. Local tastes and habits are different. That is the reason for why we are successful in the regions and develop products and processes for the market, in the market”*.

### 4.3 Market Situation and Characteristics of the Mid-Segment

This Chapter presents the data concerning ‘why’ Bühler decided to enter the mid-segment and which characteristics can be attributed to these new customers, responding to the question of ‘Who’. Further, it gives insight about ‘What’ type of product is requested. The section highlighted in Figure 4.3 below, exemplifies which section of the conceptual framework is covered by this chapter.

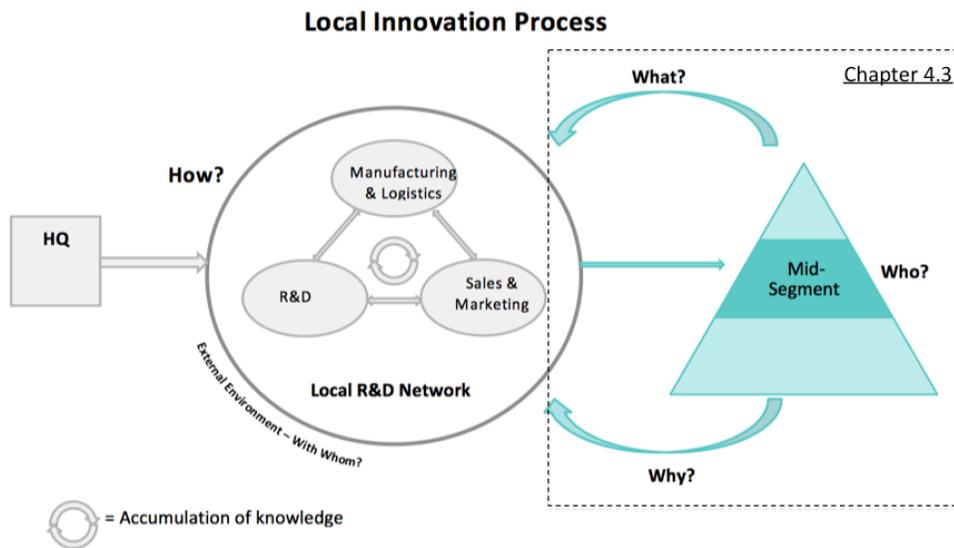


Figure 4.3 Overview of Chapter 4.3 Compiled by authors

#### 4.3.1 Bühler’s presence in the Indian Rice Market

Traditionally, Bühler served the upper part of the mid-segment of the Indian rice market with machines ranging from 8-12 tonnes per hour (TPH) of production capacity. In 2013, Bühler also expanded into the premium-segment by launching the UltraLine, which is a high-end full rice processing line aiming at the premium-segment with up to 16 TPH (See Appendix 2 A for picture). Hence, until the beginning of 2015, Bühler relied on serving this premium-/upper mid-segment market amounting to a potential share of the complete rice milling market of 40 percent, as outlined in Figure 4.4 below. So far, the extensive lower mid-segment, totalling 20 percent of the market, had not been of major interest to Bühler. According to Manager L, there were two

underlying factors regarding this limited interest. First, Bühler Bangalore took over the HQ's strategy and mind-set and therefore focused on the premium-segment. The premium customers are mostly export oriented large milling companies and Bühler traditionally require a complete solution/one-supplier strategy, not only providing the manufacturing equipment, but also accessories, automation software and services, focusing on projects with higher business value (Managers E; L). Accordingly, around two thirds of the company's turnover is attributed to projects carried out with millers who produce more than 8 TPH. Second, potential limitations such as damaging the company's image or the risk of cannibalising product lines, might also have been factors slowing down the company's entry into the lower mid-segment, as Manager L describes *"Lets say if I sell the same machine at the entry level, people on the top will not like it. So they will stop buying it, there was a lot of thought process going on, so actually it was a limitation factor."*

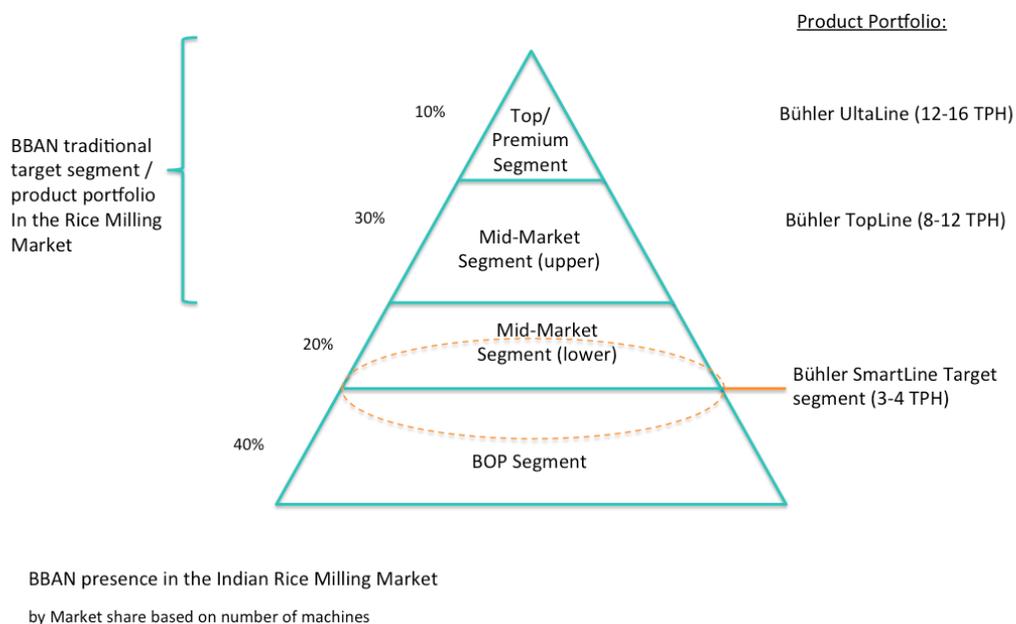


Figure 4.4 Bühler Bangalore's (BBAN) Presence in the Indian Rice Milling Market. Compiled by Authors

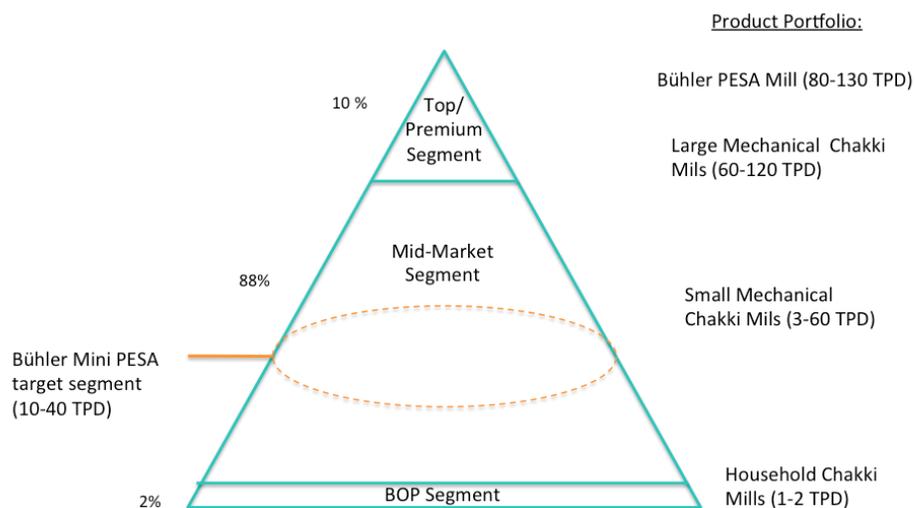
However, several factors led to the decision to develop a solution for the 3-4 TPH segment; First, pressures were stemming from the customer side. With the global rice prices constantly decreasing since early 2013, Bühler's traditionally export-oriented customers started to face challenges as their sales were decreasing or payments were not received. This led to a reduced investment capacity of the milling companies, as they were cautious to place new orders for

machinery or even replace low performing ones due to increased uncertainty, higher processing costs and reduced incomes. Therefore, Bühler had to react quickly to extend its customer base. Second, local competition was expanding into the upper mid- and premium-segments, as Manager E outlines, local competition was “[...] *growing stronger and stronger and are offering high capacity mills between 8 – 12 TPH now. They are getting into our market.*” Further scrutinizing the competitive rice market in India, there is one other major Japanese company serving the premium-segment, apart from Bühler. Whereas the lower segments, are highly dominated by local competitors, relying on a low-cost strategy. As local competitors often lack capital to invest in R&D, their focus often incorporates replicating existing technologies of market incumbents, rather than innovating own solutions (Managers C; G). Subsequently, pressures stemming from local competition increased with the rice crisis, as Manager L outlines: “*What we felt that it is not happening to the competitor, they were still doing [well], but our market was going down. Because primarily our focus was on the top market, top-mid.*” This made it clear for Bühler that they could no longer only rely on their export dependent premium customers, therefore leading to take fast measures to enter the growing lower mid-segment, as Manager L confirms “*That was the time we realised and said we needed to work in that direction, so that triggered the reaction.*” Hence, the reasoning behind the initiative to develop a product for this specific target segment was “[...] *to limit the risk of them [the competitors] coming into our market, and at the same time expand ours to where they are.*” (Manager C).

Bühler decided to respond to these market changes by developing a downscaled whitener and polisher with a reduced capacity of 3-4 TPH, thereby targeting the competitive lower mid-segment. The development was pushed through in 6 months and since its launch by the end of January in 2016, the SmartLine Rice Processing Machines (SmartWhite Rice Whitener and SmartPoly Rice Polisher) (See Appendix 2 B for picture) are specifically targeting resource-constrained small and medium enterprise (SME) millers, who currently buy their equipment from hundreds of small local engineering companies spread across India, as well as one local competitor based in Bangalore. However, in this context it has to be noted that Bühler first tried to enter the mid-segment in the rice market with a stripped down premium product, which according to Manager I was a failure, as it did not correspond to the SME millers needs. Hence, it can be argued that these lessons learned helped when developing the SmartLine.

### 4.3.2 Bühler's Presence in the Indian Atta Flour Market

Atta is a whole grain flour used to produce Indian bread such as chapati and roti, which is traditionally produced on stone mills, called Chakki Mills (see Appendix 2 C for pictures). There is a vast number of Chakki Mills across India fulfilling the population's need for atta flour amounting to 62 million tonnes per year. Traditionally, no Western MNC was present in the market, as it is a local technology used by thousands of milling companies in India, whereas the competitive landscape is equally fragmented, dominated by regionalised SMEs (Managers B; D). Further, "Anybody can assemble a chakki mill with two stones that can run. It is not a protected technology, and no dominant competitor, but we have hundreds of small people who have factories that can make the technology." (Manager D). Figure 4.5 below presents the market segments of the Indian atta market based on capacity in tonnes per day (TPD) and the percentage of millers producing this kind of capacity.



BBAN presence in the Indian Atta Milling Market  
by Market share based on number of machines

Figure 4.5 Bühler Bangalore's (BBAN) Presence in the Indian Atta Milling Market. Compiled by authors

The big majority of nearly 88 percent is produced on small and medium size mechanical chakkis, covering 54 million tonnes of the consumed atta in India (Manager E), whereas this segmented market is dominated by millers producing between 10-40 TPD (Manager S), running 3-4 chakki mills in a row. The segment of large mechanical chakki mills with a capacity of 60-150 TPD (see Appendix 2 D for picture) is expanding, as the SME millers from the mid-segment upgrade their production, leading to the expectation of market consolidation. Currently, the segment of large

mechanical chakki mills contributes 10 percent of the market producing 3.1 million tonnes of atta. Although they are slowly disappearing, household chakki mills still represent 2 percent of the market, producing 1.2 million tonnes of the Indian flour.

One of the main reasons to develop the premium PESA mill was that no other technology existed to replace the traditional stone mills (see Appendix 2 E for picture). Subsequently, before Bühler entered, the atta market had not been targeted by any of the leading MNCs of the grain milling industry. In fact, these were the key arguments to develop a technology that could replace the traditional stone mills and offer a more hygienic, lower energy consumption mill, while offering the same taste. The outcome was a high-compression roller mill, which was a joint development between HQ Bühler Uzwil and Bühler Bangalore, initiated in the mid 2000s. After extensive investments in R&D, the premium PESA was launched in January 2015. The machine offers a solution for millers producing 80-130 TPD, normally on up to 20 Chakki mills running in a row, while reducing energy consumption by 10 percent (Manager S). Hence, the premium PESA clearly targets the large atta flour millers at the top-end of the market. However, despite developing a successful technological breakthrough-innovation, the launch of the premium PESA mill revealed several challenges. First, as the premium PESA mill is replacing a hundreds of years old production method, Bühler had to work on creating market acceptance that the new solution would deliver the same taste as the flour produced on stone Chakki mills (Managers B; D). For example, Bühler Bangalore cooperated with the Central Food Technological Research Institute, which gave feedback on the finished atta flour (Managers D; E; H), and thereafter granted a third party quality confirmation (Manager M). Second, only 10 percent of the millers produce in the capacity range of the premium PESA Mill, representing only a small proportion of the market. Third, the market was expected to consolidate quickly into more big millers producing between 60-130 TPD, which was one of the reasons why the premium PESA Mill was built as a high capacity mill. Yet, it became clear that the speed of consolidation is closely interlinked with the consumer preferences of demanding fresh atta flour. Hence, it is still common to use roadside chakkis and produce for a week's or month's requirement (Manager H). Though it is expected, that with more time-constrained consumers, increased urbanisation, and changing behavioural patterns, these small village level mills will disappear in approximately 10-15 years (Business Sweden; IGCC; Manger M). Still, the mid-segment is diversified with numerous, regionalised SME millers, as Manager H explains *“There is thousands of mills in*

*India, they are all small capacity, catering and only looking on that particular region”*. Additionally, most of the SME millers are family businesses (Manager H). Hence, the consolidation did not evolve at the expected pace, leaving open a large segment not catered by any existing Bühler technology. Consequently, Bühler Bangalore responded quickly to these findings and initiated the development of the Mini-PESA Mill in mid-2015, targeting SME millers, producing between 10-40 TPD, representing up to 40 percent of the traditional atta industry. The Mini-PESA Mill replaces up to 3 Chakki Mills and will be launched during the next few months. Further, this is a strategic move to accelerate the acceptance and awareness of this new technology in the market.

#### 4.3.3 The Characteristics of the Indian Milling Mid-Segment

It might be held in belief that serving either the flour- or rice market implies differences in the respective needs and requirements of the mid-segment customers. Yet, these millers display similar traits, as they have similar mind-sets and needs (Manager L). Therefore, this section takes both the rice and flour millers into account when referring to the mid-segment SME millers.

##### *Affordable solutions, no compromise on quality*

According to the managers, SME millers need a machine requiring lower upfront investment, as they display a lower financial strength and thinner margins, as compared to the premium-segment (Managers C; D; E; H; J; K; L). However, it is stressed that this by no means implies a compromise on the quality of the product, as both mid-market products follow the global Bühler quality standards (IGCC; Managers C; G; I; J). Rather it is a balancing act between price and quality, as Manager I explains that entering the mid-segment entails *“Not only reducing the price, [...] That is not Bühler”*. This becomes most evident considering the careful positioning of the SmartLine. Bühler stands for high-quality Westernised solutions, which creates some aspirational brand value among the SME millers, and differentiates them from competitors (IGCC) as Manager E puts it: *“It is great if they [the SME millers] can get one of our machines at a lower price, because even the lower priced ones do not come cheap.”* In this context Manager L outlines that the mid-market customers *“do not like low cost, from a [brand] reputation point of view.”* Meaning that, they are not particularly fond of products that come with the image of being the ‘cheapest’ solution. Indeed, they might be willing to pay a small premium, given that the solution offers additional advantages compared to competing offerings. Such

advantages may entail financial support systems, or considerably higher quality of the machine and the rice or atta flour it produces (IGCC; Managers G; J).

#### *Ease-of-use, less automation, maintenance and technological features*

SME millers require a product and process that entails ease-of-use. This takes several forms, and as Manager J puts it: *“They do not want the high sophisticated machines, fully automated and these things”*. Hence, they require less high-tech and automation than the premium-segment (Managers E; G; I; J; K). Further, the need for a simpler product also applies, as the SME millers demand less complicated maintenance (Managers B; M). Although a lower technological knowledge of the SME millers is seen as one explanation, other factors also come into play contributing to this need. According to Manager C, *“Labour is kind of cheap comparing to investing in automation and remote reporting technology”*. Hence, SME millers prefer to manage and maintain several otherwise automated procedures themselves, rather than investing in the expensive technology, or engineers to administer them (Managers C; D).

#### *Lower technological knowledge*

The lower technological knowledge compared to the premium stems from, on the one hand, that smaller farmers have not received the same level of technological education. On the other hand, SME mills are to the majority run as family businesses, thus not employing expensive service engineers to take care of the machines (Managers C; D; E; F; L). This leads to the need for machine suppliers to take a more supporting role compared to the premium segment. IGCC argues: *“So if you are not interested in training them [the customers], it will not work”*, thereby implying that the suppliers must educate their mid-segment customers in how to handle the equipment. This is elaborated on by Manager G who notes: *“You are required to develop this market, to do more consulting [...] to include mentorship also”*. Thus, milling machine manufacturers targeting the mid-segment would do well by catering to their need of educating them.

#### *Single-machine business and speed-to-market*

Comparing the mid-segment to the premium, Manager D explains: *“[Premium] go for a supplier that takes care of the process from end-to-end [...]. Whereas, as they [mid-segment millers] manage the operations themselves, they can mix and match between different products, and are not worrying so much of a single-source supplier”*. Therefore SME millers are in need of a product that is compatible with other processes, and value flexibility higher than being loyal to

only one single-machine provider. This adds additional challenges to the product design in terms of compatibility with non-Bühler equipment found in the market (Managers C; E). Adding another aspect to that, Manager L states: *“The entry level [mid-segment] is very sensitive to the time, they want the machine to be there, now.”* According to Manager C, a reason for this is that they buy smaller paddy volumes, yet more frequently than premium millers. As a result, they plan on a more ad-hoc basis, thereby requiring a high flexibility of the supplier. This, in combination with that all new machine installations take place between the seasons, leads to a need of the supplier responding quickly to the new machine order, thereby adding extra pressure to the manufacturing and delivery times. Therefore, being active in the mid-segment calls for higher focus on flexibility and responsiveness, compared to the premium-segment.

#### *Increased regionalized focus and knowledge*

Being active in the mid-segment requires additional regional understanding, comparing to the more nation-wide focus in the premium-segment. That is, as SME millers are dispersed in the rural parts of India, targeting only their own region since branching out is nearly impossible, as their low margins do not allow for increased logistic costs (Managers E; C). Adding to that is the differing food-tastes in India, as Manager G exemplifies: *“Wheat is an extensively used commodity, it is the main food in the northern part of India, and it is sort of a breakfast cereal for the southern part”*. Subsequently, this complexity calls for the suppliers understanding regional preferences to develop a machine, correctly suiting the needs of the dispersed SME millers (Manager E). Moreover, the lacking infrastructure in India leads to longer delivery times, demanding a more regionalised distribution strategy (IGCC; Business Sweden).

#### *Create a see and feel*

There is a greater need for convincing the SME millers that the product works, as promised. In order to assure them, that the product is of high quality and yet affordable, they need to see the product physically before buying it. As Manager E explains *“It [the machine] has to match the price and quality of the specific market, which is why it becomes important to show them the machine. [...] That the customers can come, see and feel the product”*. Hence, they need persuasion to convince them that the quality is as high as guaranteed, which is facilitated by local presence. Furthermore, marketing must also fall in line with what is workable when approaching the customers, again Manager E: *“It is a different type of customer, they need more social*

assistance.” Therefore, the Sales & Marketing staff must personally promote the products locally and change their marketing strategy for that specific segment (Manager E).

In summary, the characteristics in the mid-segment are in many senses different from the premium, this mainly refers to that products need to be affordable without compromising on quality, with less automation, less maintenance, and less advanced technological features. Further, machine suppliers must also consider supporting and educating their customers, the speed of manufacturing and delivering their machines to the market, attain a deeper local understanding, and establish more regionalised distribution, sales, and marketing channels.

#### 4.4 The Process for Innovation and New Product Development

This chapter presents the data on how the actual development process is organised and how the characteristics of the mid-segment customers influence the solution offered by other departments along the value chain. Figure 4.6 below, provides the reader with an overview of where this part corresponds to in the conceptual framework.

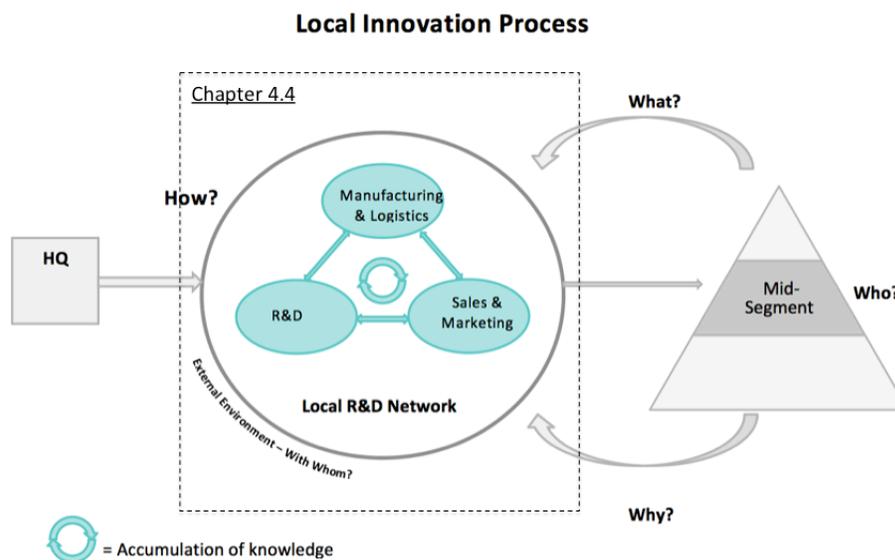


Figure 4.6 Overview of Chapter 4.4. Compiled by authors

Innovation and new product development are organised through a formal process, named the Market-to-Market process, which is globally applicable. It is based on the overall idea that one has to be close to the market to spot trends and generate new ideas that create more value for the customers, as the CEO of Bühler Group emphasises “We can’t tell the market what to do. The market will tell us.” (Manager R). In this line, first ideas and market opportunities are analysed

by the M2M or CT department based on market potential, customer benefit, associated risks and so on. The outcomes are then presented to the management where it is decided, if the idea is to be proceeded (Managers B; D; G). Thereafter the innovation process is initiated, and is structured in four stages: Business Plan, Conception, Development and Introduction. The different stages and decision Milestone (MS) gates are outlined in Figure 4.7 below, which will guide the subsequent explanations of each stage.

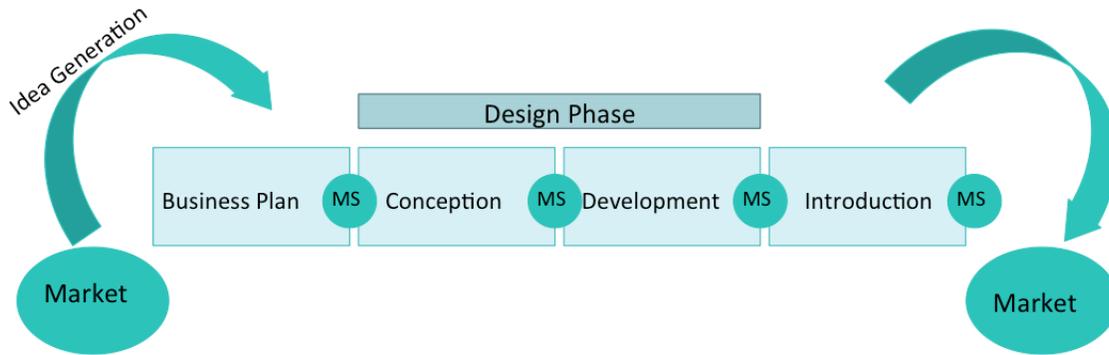


Figure 4.7 Bühler's Standard Market-to-Market Process. Compiled by authors

During the first Business Plan phase, aspects such as market positioning, pricing, unique selling points (USP), partners, and competitors are analysed, summed up as thorough market research and careful identification of the target segment. Depending on the project, this idea generation phase and business plan is done by CT or the M2M department, both following the same procedure (Manager G). The responsible product manager takes a key role the development process, as Manager G explains *“He has to hold the market together, the marketing, make plans, pull the R&D guys, the customer service, technology.”* Further, the product manager has a constant eye on the market and collects information from Bühler's sales force, traders, and gets involved directly in field work on customer site (Manager C).

After the business plan is approved, the project is moved to the Conception phase, performed by the CT or M2M department. This phase clarifies which technology and processes are to be used, to meet the goals specified in the business plan. The core function of the M2M team is to support during the development and design phase, by writing the concept, assist with drafting, design and prototyping, and identifying local suppliers (Manager G). Hence, the M2M and CT teams nearly solely focus on the product development, whereas the R&D teams are focusing more on research (Managers B; D; G; H). During the Conception phase, the CT department relies on frequent input

from the other functions, as Manager B explains “[...] where I act as a project manager, so we need help from drafting, we need help from sales, we need help from electrical, this type of things we take from M2M, R&D, automation and all.” After a product sketch is available, Manufacturing & Logistics assist with building the metal structure to ‘prove’ the concept and assess the potential production costs. This collaboration and on-going support continues until the Development phase (Managers B; J).

After the concept is approved, the Development phase is initiated. Thereby, the product is tested, and it is deeper assessed how it can be manufactured. At this third stage, the project is assigned to the New Product Introduction team, belonging to the Manufacturing & Logistics unit, taking all the necessary administrative steps, e.g. uploading the material structure into the Enterprise Resource Planning system. Essentially the team provides everything necessary to sell the product (Manager J). Also, Supply Chain Management must be involved early to verify if the proposed design runs smoothly through the manufacturing process, which materials are to be used, and what is to be manufactured internally or can be outsourced. Hence, the R&D unit provides the design, whereas all the manufacturing knowledge comes from Manufacturing & Logistics.

Next, the Introduction phase, concerns the product launch, where parameters like market positioning and pricing are re-examined. Further, it is decided through which channels the products are to be sold, and how the product will be launched to the market. At this stage the involvement of the Sales & Marketing function increases, as the product launch is planned (Manager E).

To sum up, the process generally takes between 4-5 years from idea to product launch, as it is a ‘full-proof process’, ensuring that every step is covered properly and signed off accordingly (Managers C; D; G). As Manager G further explains: *“If you go to the Market-to-Market processes, normally you will put a lot of pressure on the timeline and the cost.”* Subsequently, a suggestion made by several managers is the set-up of a ‘light’ process for innovations targeting the mid-segment, with the aim to increase the speed-to-market significantly and reduce the time-consuming Milestone decision gates. In this vein, it was also outlined that this would be most applicable to developments based on existing technologies, where less research is involved (Managers D; E; L). The next section will present the data on if and how the development of the two mid-segment products under analysis deviated from this standard development process introduced previously.

#### 4.4.1 The Differences of the Mini-PESA Development Process

The Mini-PESA mill did not deviate much from the standard development process outlined above, and is soon entering Development and Introduction phase (Managers G; M). Hence, it has gone through the majority of the development process (ca. 80 percent) (Managers B; D). Comparing the development of the premium PESA to the Mini-PESA, one of the main differences, is the composition of the project team and project lead location. The premium PESA was a joint development of Bühler Uzwil and Bühler Bangalore, whereas the project team in the official document nearly exclusively consisted of Uzwil employees. However, as Bühler Bangalore contributed with local market knowledge during the development process, the local involvement was estimated at 40 percent (Managers D; G). As such, the M2M department did drafting support, especially concerning local technological requirements, whereas the core design was delivered by the Technology and R&D unit. The core milling knowledge was held by the Swiss R&D business unit, being their area of expertise. Hence, the premium PESA was a mixture between Swiss flour milling expertise, Indian atta milling competence, and local market knowledge (Manager G). In contrast, the Mini-PESA was a local development of Bühler Bangalore, where local involvement was estimated at 80 percent, whereby the project team consisted of only Bangalore employees (Managers B; D; G; M). Hence, Bühler Uzwil acted as a mentor, providing overall guidance and supporting with knowledge on process technologies (Managers B; D; G; M). Therefore whereas the project lead of the premium PESA was held by Uzwil, the one for the Mini-PESA is held by Bangalore, or as Manager G emphasises: *“Here [premium PESA] we were supporting Bühler Uzwil, and we were building according to the Bühler Uzwil instruction, here [Mini-PESA] Bühler Uzwil supported us and we were building according to the local way.”*

For the premium PESA, extensive market research led by the Swiss R&D grain-milling unit, was carried out to develop a solution acceptable for the local Indian market. After various visits, gathering local input, the business plan was developed. Additionally, the Swiss team collaborated with the local team at Bühler Bangalore during Conception phase. For the Mini-PESA however, market research was carried out by the local CT department, heavily collaborating with the technologists from the sales unit and local customers (Managers B; G; M), especially when identifying the acceptable price point for the particular target segment (Manager B; E).

Further, the Mini-PESA development was intended to be initiated with a ‘clean-sheet’ approach (Manager M), meaning that the team first did not consider using the premium PESA technology, but rather aimed at finding a completely new solution meeting the needs of the mid-market millers. As Manager M further explains “*There is no intention in the beginning to make the Mini-PESA. The target was to make a machine that would target the lower market, that is where the discussion started. No plan to scale down the [premium] PESA.*” However, the time and investment taken on the premium PESA, as well as the internally available knowledge, eventually led to the adaption of the premium PESA technology (Managers B; D; M). Further, starting from scratch would have significantly lengthened the development process, thereby increasing the time-to-market significantly (Managers B; D; M), as Manager M supports “*...to reduce the development time and technological risk, the group decided to stay with the PESA process, it happened almost in 2 months.*” However, although the core technology is based on the premium predecessor, the Mini-PESA development first and foremost considered the SME miller perspective, as it was engineered with simplicity and ease-of-use as its main basis, e.g. using a screw to create pressure, instead of the complex high-tech hydraulics of the premium PESA (Manager D). In addition, Manager I highlights that the Mini-PESA development entailed an entirely different business model concept, compared to the premium.

Another difference was that the big premium PESA could only be tested on customer site, as its huge capacity made it impossible to test in-house. For the Mini-PESA however, a complete in-house testing prototype was developed, which reduced the time and awarded more flexibility, as Manager M describes “*If we face a problem we can identify it, no need to wait for the customer time, when he is commissioning it, when his time is available, these things are very critical.*”

Additionally, the role of Bühler Bangalore changed between the development of the premium PESA and Mini-PESA. According to some managers, the successful joint development of the premium PESA increased the HQ’s trust in the local team at Bühler Bangalore, leading to increased autonomy when developing the Mini-PESA. Therefore, the Mini-PESA was one of the first projects of the local grain milling R&D team, located in Bangalore since 2012 (Managers M; D). Consequently, it is regarded that the technological knowledge exchange between the HQ and local R&D unit, led to an increased trust in Bühler Bangalore to develop their own products, such as the SmartLine and Mini-PESA. As Manager D concludes: “*I would say that the [premium] UltraLine and [premium] PESA development gave a lot of confidence. The Uzwil [HQ]*

*management understood that we could handle such projects and product developments on our own.”*

To sum up, whereas the Mini-PESA overall followed the standard product development process, it still differed in the aspect that the lead was held locally by Bühler Bangalore, the project manager was from the local CT department and the testing was done in-house. This, in combination with the fact that the Mini-Pesa, was using the premium PESA technology, served to reduce the time of the development process significantly comparing to its premium counterpart.

#### 4.4.2 The Differences of the SmartLine Development Process

All interviewed managers agree that the SmartLine did not follow the standard Market-to-Market process. One of the key differences highlighted was the aspect of speed-to-market influencing the development process of the SmartLine, compared to the standard process (Managers C; D; J; L). As Manager C explains *“We wanted to do this in 6 months time, so it was not profitable to do the general process.”* Therefore the development of the SmartLine was more of a teamwork between Manufacturing & Logistics, R&D, M2M and the technologists of the sales unit (Managers C; L).

Moreover, price was put first during the SmartLine development. Due to existing competitors with similar products, holding significant shares in the mid-segment, the development team knew which price point they had to achieve. Therefrom, the technique of value engineering was applied. This means, breaking down the product into its primary, secondary and tertiary functions, calculating the cost for each component, and analyse the manufacturing process to check if there are alternative steps that would reduce the cost. From there, features were excluded if deemed not needed for the target segment, without compromising on quality or a primary function (Manager L). In this line, Manufacturing & Logistics came up with a structure that made it easier and quicker to produce the SmartLine (Manager C). Hence, Manufacturing & Logistics took a central role from the beginning of the process (Managers C; J; L), which is another core difference to the Market-to-Market process, as Manager C supports *“The basic concept was developed by manufacturing. R&D improved those concepts and ensured that the machine functioning is up. That was challenging because generally manufacturing comes into the picture when the product design is ready, and in this case we worked together.”*

Consequently, this led to an increased collaboration between Manufacturing & Logistics and the R&D unit compared to the standard process, as Manager C outlines *“They [Manufacturing &*

*Logistics] are based on their manufacturing knowledge and they also had inputs, and sometimes their suggestions might not have been technically correct. R&D had to have patience with that [...] So there was more interactions and more close collaboration required.”* Therefore, the success of the product was largely dependent on how well all the departments work together, as Manager C highlights *“It was not that one finished their job and shipped the development to another department [...]. That was why we could deliver, because everybody took the responsibility, and worked together.”*

Additionally, when comparing the development process of the SmartLine to the premium UltraLine, there was a different situation regarding where the technological knowledge was held. When the premium UltraLine was developed, the R&D competence for the Rice business unit was bundled at Bühler Braunschweig (Germany), who carried out the market analysis and provided Bühler Bangalore with the necessary technological support. The local R&D team in Bühler Bangalore used the technology of Bühler Braunschweig, added some features and changed the profile of the machine in order to adapt it to the local requirements (Manager L). For SmartLine in contrast, all the competencies were found locally, such as Manufacturing & Logistics, R&D, Sales, and Technology (Manager J). Moreover, with the prior development of the premium UltraLine, Bühler Bangalore acquired knowledge of which processing technology could be used. Manager C exemplifies: *“Hence, the manufacturing team was experienced since they had developed those machines. They could play a key role in such a project. But if we would develop a high capacity machine with new technology, the manufacturing do not have the knowledge advantage as it is new for them, therefore R&D plays a bigger role.”*

Overall, the successful collaboration between Bühler Braunschweig, Bühler Uzwil and Bühler Bangalore during the development of the premium UltraLine, increased the HQs trust and autonomy in Bühler Bangalore and is commonly considered as the main reason for Bühler Bangalore being awarded the local project lead when developing the SmartLine (Managers C; D). Hence, the HQ involvement was rather limited to the approval to innovate the machine, as Manager C explains: *“Of course we presented the reason for why we were developing it [...] They [the HQ] understood the concept and gave us complete freedom to work on it.”* In addition, the premium UltraLine project team incurred extensive market and technological research starting from how the rice grows, how the chemical composition changes over time and how it influences the machine, which was a process that almost took 4.5 years. Contrary for the

SmartLine, there was no research or extensive market analysis involved, as the main goal was to reduce the product cost and quickly launch it to the market (Manager L). Further, when developing the Smartline, Bühler Bangalore collaborated with other Rice business units in e.g. Asia. Instead of coming up with a complete new low-cost huller to complement the rice whitener and polisher, the local team found that Bühler Vietnam already had developed a low-cost machine suiting the need of their mid-segment. Hence, by adding that solution, as well as including a hull-separator from China, Bühler Bangalore expanded the SmartLine portfolio without investing in additional R&D (Manager C).

Concluding, the SmartLine was not following the standard Market-to-Market process, but was more of an innovation centred around the Manufacturing & Logistics function, as Manager L outlines *“So it was more of a feature reduction, process reduction, manufacturing cost reduction [...] handling of the items quickly [...] So this was more of a manufacturing innovation.”* On the one hand, this deviation from the standard procedures, offered a lot of flexibility and significantly reduced the timeframe, but on the other hand, the design had to be ‘full-proof’, without passing the approval Milestone gates of the standard Market-to-Market process (Managers C; J).

To provide a better overview of the foregoing parts, Table A3.1 in Appendix 3 summarises the differences in the development process of the two mid-segment products compared the two premium counterparts.

#### 4.4.3 Implications for Other Departments

After understanding to what extent the mid-segment products deviated from the standard Market-to-Market process and how the R&D units collaborated with the other functions, this section will present which implications this had on the other departments along the value chain. In fact, for Bühler, successful innovation implies much more than considering exclusively the product side. As Manager I explains: *“I see it more as a concept, not a product, because the concept is a combination of all the activities in the value chain.”* Hence, more detailed data on the measures taken to come up with an attractive value proposition for mid-segment is presented, which applies to the development process of both the SmartLine and the Mini-PESA.

#### *Manufacturing & Logistics*

In terms of Manufacturing & Logistics, it has been highlighted that the customers in the mid-segment are time-sensitive, meaning that the standard delivery time is not sufficient. In case of

the SmartLine, by standardising the production process and the components used, the delivery time was shortened substantially from 8-12 to 2-4 weeks, which was seen as a major accomplishment and required extensive machine design simplification (Managers C; J). Another aspect to consider, is the scalability of the production premises (Managers D; I). Currently, Bühler predominantly produces for the niche premium-segment, characterised by a low number of machines, whereas entering the mid-segment and its single-machine sales, ideally implies selling a vast quantity. However, for Manufacturing & Logistics, the concerns of scalability are solvable challenges, encountered by producing the core machine parts in-house, while outsourcing other components. Another important aspect according to some managers, is the advantage of producing and sourcing locally, especially including suppliers in the development. As Manager J explains: *“Try to localise as much as possible [...] and develop the supplier here. Sometime you do not get a ready-made solution, you have to develop the supplier, that is most important.”* Therefore, including the suppliers early in the process and building local ties, serves to make sure that the development runs quickly, and eventually reduce costs. That is especially so, as the production of some machine parts is deemed more effective to outsource. However, suppliers had no active role in the development of either the SmartLine, or the Mini-PESA (Managers B; C; J; M).

### *Sales & Marketing*

From a Sales & Marketing perspective, the main difference between the premium- and the mid-segment products is that the first is considered a ‘value sale’, whereas the latter is a ‘commodity sale’. This requires a change of strategy for Sales & Marketing, as it increases the amount of potential customers, as well as the sales territory substantially (Managers C; E). Thus, creating awareness within this highly fragmented market is a daunting task, where regional differences play an important role, as Manager C concludes: *“Here we are talking about small scale rice millers of a vast number, so we have to go more regional.”* One suggestion, is to take the launch in several steps, as nation-wide product introduction leads to budget constraints and a decreased focus on the specialities of each region. Hence, the SmartLine has been launched in different provinces and capturing the market bit-by-bit (Manager E).

Accordingly, when targeting the mid-segment, it is of utter importance to create ‘reach’ in such a geographically dispersed market like India (Business Sweden; IGCC, Managers B; C; D; E; F; I; J). Therefore, the SmartLine is sold through channel partners, which is also expected to happen

for the Mini-PESA mill, although the final decision has not been made. This offers the advantage of using the local network of channel partners to increase the spread of the product. Further, it is a cheaper way of distribution as the Bühler direct sales teams are predominantly high-educated engineers, whose every spent minute counts (Managers C; D; F; I; J). Therefore, the direct Bühler sales force exclusively concentrates on the more complex products of the top market, whereas single machine sales as the SmartLine, are sold by the channel partners (Managers E; I). This also corresponds to that premium customers mostly invest in a full producing line and value automation, single point of contact, full service packages, and mainly decide based on the return on investment, alluding to the above mentioned 'value sales'. The big advantage of the channel partners is outlined by Manager J, who argues: *"They [the channel partners] are close to the customer and it is also a cheaper way for the distribution instead of using your own organization. You save costs, proximity to the customers, otherwise you will not get there."* However, the use of channel partners, also requires an extensive amount of training, as they do not only have to sell the machine, but also take care of the machine installation and the delivery of service and spare parts (Managers C; E; K). As Manager E exemplifies: *"We need to be with them, as once they communicate with the market, they must say the right things [...], because it would harm us if they speak wrong about our products [...] they need also to make the service."* This is closely interlinked with the Human Resources function, where this training aspect of the channel partners will be taken up. As Manager E confirms *"The [main] learning is that you need to make the channel partners technically strong, that is crucial. The training and being with them initially."*

Another topic crucial to consider from the Sales side is that in India, relationships are sometimes more valuable than the business itself, as Manager F clarifies *"We are like 1.3 billion people, so for us the relations keep major decisions [...]. In India relationships are given more importance than even the business itself."* Hence, this could be catered better by the channel partners, as they are well established in the region, with existing customers, and add to the local credibility of Bühler (Manager C). Additionally, Manager G added that this type of customers also must be approached differently. They might rather feel too small to buy from a supplier whose salesperson tries to convince him by showing a sophisticated iPad presentation. Further, the aspect that it generally takes more time to convince SME millers, needs consideration (Managers E; H). Therefore, getting an endorsement from an existing local customer, could be an efficient way of generating more sales (Manager G). This approach is utilised by the Sales & Marketing

department, as they engage in collaboration with existing rice milling customers, whereby they offer a smaller price reduction in exchange for the rice millers showcasing their machines to other potential customers. In addition, marketing strategies in the mid-segment, such as loading the smaller machines on a truck for a cross-country road show, have been employed to further convince the suspicious SME millers (Manager E). In terms of marketing activities directly related to the launch of the product it was mentioned, that communication must be broadened and translated into more local languages, as potential customers might not be fluent in English (IGCC; Manager C). For the SmartLine, the marketing material was translated into 8-10 local languages (Manager C). Building on this Manager E outlines: *“The channel partner also has local guys speaking the language, because it is very important for bonding and understanding.”* In this line, the *“Medium of reaching the target is also different [...]. We can not only go with the existing communication media without expanding it [...] to be successful in this segment”* (Manager C).

#### *Human Resources*

From the Human Resources perspective, it is crucial to establish the right culture and mind-set, creating a climate for collaboration to facilitate innovation. This is done, by recruiting and developing multi-talented local employees, who are flexible in their minds and opt for changing their role and tasks throughout their career (Manager F). This is exemplified in the career development of the current CEO, as Manager F explains: *“[...] Prashant our CEO, he started in drafting, became a project manager, working on new product innovation, then he moved to customer service. Then he moved on to sales, then to sales of GM, then Food sale, then sales AM, then he became CEO.”* Gaining experience in various departments usually creates a better market understanding and more mutual understanding when collaborating with other functions (Manager F).

Further, an open door culture where managers are easily approachable, the open office spaces and the co-location of departments, are all factors that help to establish a collaborative climate, which increases the knowledge-exchange between the different functions and roles. Regarding their involvement during the development process of the two mid-segment products, the training of channel partners and customers was primarily attributed to Human Resources, among others having a large role in establishing a learning centre, serving to develop these mid-segment actors. Further, the Human Resources function is aware of all the on-going development projects

through monthly management meetings and gets involved in the standard Market-to-Market process, whenever there is a specific issue related to training or recruiting partners (Manager F).

#### *Service*

From a Customer Service perspective, they assist in training channel partners to repair the machines and increase the ease-of-use to let the operators handle more themselves. Further, it was outlined that a maintenance service-package for the Mini-PESA would make sense, for example a smaller upfront payment amended by a usage fee based on the tonnes produced (Manager D). Such measures could differentiate Bühler from the competitors and provide another argument from the Sales & Marketing perspective to convince the price-sensitive customers of the mid-segment. Further, Customer Service supports in the development process by routing direct customer feedback to the R&D, M2M or Manufacturing & Logistics department, hence presenting an important source knowledge concerning the needs and opinions of existing customers (Manager K).

#### *Finance*

In terms of Finance, some managers hold that to target the market better, it would help to include a financing helping scheme for the SME millers in the value proposition. In more detail, options like offering some initial rent-free months, to enable an initial return on investment for the SME millers, or to use Bühler's reputation as a well-established global player to ensure a bank loan for the customers (Managers D; J). As Manager D further explains: *“At least we should have an agreement [...] that they make some money and then start paying us. A new business model is definitely needed for this market.”*

To sum up, the mid-segment product development entails implications on all above-mentioned functions, albeit to a differing degree. Thereby, Manufacturing & Logistics and Sales & Marketing have a larger role in the development of the mid-segment products, as it has more implications on the two respective units, which is partially so also for Human Resources. Further, Customer Service and Finance have less direct implications, as they have a more indirect role in the development process. Yet, it is important to mention that all must be aware of the characteristics of the mid-segment, in order to come up with creative ideas to build tailored value propositions. Therefore, inter-departmental collaboration and idea exchange is key since the potential USP can originate from any function.

## 5. Analysis

*This chapter intends to provide an answer to the research question of ‘How do Western MNCs organise their development process when innovating for the B2B mid-segment in emerging markets?’ In order to answer this question it is analysed to what extent this case study resembles to the phenomena described in literature and then the most evident findings regarding the organisation of the development process are outlined with regards to the conceptual framework. This section is ended, by providing a finished revised conceptual framework incorporating all findings presented.*

The revision of Bühler’s entry into the mid-segment of the rice and the atta flour industry in India has shown, that this decision to expand to this market segment was based on two main reasons. First, the changing customer preferences calling for the same quality at a substantially lower price, which is the common situation for Western MNCs (e.g. Jullens, 2013; Ramamurti, 2012). Second, the competitive situation, especially in the rice market, has shown that local players are strengthening their position in the mid-segment, and expanding into the higher segments of the industry, thereby challenging Bühler’s position in their traditional top-mid- and premium-segments. This situation corresponds to what has been outlined by Little (2008) and Ramamurti (2012), and therefore also increases the pressure on the Western MNC, as Bühler Bangalore, to react before their incumbent position becomes threatened. Further, this case provides evidence that the characteristics of the SME millers of the rice and the atta flour industry are in line with what is presented by Little (2008) and Gadiesh et al., (2007) implying more functionality at a lower cost, increased local sourcing and high volumes combined with thin margins. Therefore, this presents an ideal case to analyse how companies organise to innovate solutions that are appealing to this, for Bühler, new customer segment.

*Innovation not only on the product side - but more a whole concept*

To start with, the case of Bühler showed that in order to successfully innovate for the mid-segment in emerging markets, MNCs have to innovate on three sides: the product, the business model and the underlying organizational structure confirming the assumptions of e.g. Assink, (2006), Eyring et al., (2011), and Shankar and Hanson, (2013). The results of this study confirm, that this ‘innovation tripod’ has proven to be crucial to come up with a viable solution for the resource-constrained customers of the mid-segment.

Further, this case study shows that the specific characteristics of the mid-segment (i.e. What? Who? and Why?) have implications on ‘How’ the development process is organised, and ‘How’ the solution is delivered to the customer. This shows that Bühler operates two different business models, one for the niche premium-segment and one focusing on the mass-market in the middle of the pyramid. This is in line with Winterhalter et al (2015) who highlight the challenges of operating two business models for the same region simultaneously. However, compared to previous studies, the results present deeper information on how every aspect of the value chain is tailored to the actual needs and characteristics of the target segment. Accordingly, the findings of this study suggest a revisited conceptual framework on which aspects to keep in mind, when organizing for innovations targeting the mid-segment in emerging markets.

### 5.1. Organizational Structure Facilitating Mid-Segment Innovation

#### *Importance of local knowledge - Local lead*

The failure of Bühler taking a ‘glocalised’ approach when first trying to enter the mid-segment of the rice processing industry, shows that companies actually do have to ‘dig deeper’ to innovate a value proposition suitable for the resource-constrained customers (e.g. London & Hart, 2004). Further, this is supported by Little (2008) who found that the lower the target segment, the more local knowledge must be involved. This is connected to the underlying mind-set, as outlined in the development process of the premium PESA. As the project lead and market research was concentrated to the central R&D team, it implies that a Western mind-set exacerbated the process, making it difficult to understand the local millers, which is in line with Prahalad (2006) who argues that involving only Western managers in the development of mid-segment products may infer difficulties to understand the target customers’ needs. Hence, this study confirms that a key aspect to successfully innovate for the mid-segment in emerging markets is to award the lead of the development effort locally, as suggested by Zeschky, Widenmayer and Gassmann (2014), Immelt et al., (2009) and Shankar and Hanson (2015). Therefore, assigning local managers to the development of these mid-segment innovations, increases the local innovation capability in the mid-segment.

#### *Establishing a separate unit to spur local innovation*

This study provides evidence that the Bühler HQ is committed to its strategy of spurring local innovation by establishing CT as an independent R&D unit, carrying out extensive local market research, and collaborating with customers. This shows similarities to the Local Growth Team

coined by Immelt et al. (2009) and hence also the suggestions of Gebauer et al. (2009) and Gadiesh et al. (2007), of a separate local R&D unit managing local innovations. The underlying organizational structure of being a decentralized unit yet belonging to a matrix structure directly reporting to both the HQ CTO and the local CEO, further emphasizes the arguments of Mudambi (2011) regarding direct communication channels between the HQ and Subsidiary managers, and creating an environment enabling fast decisions to enable successful mid-segment innovations. Therefore, Kuemmerle's (1997) notion that Western MNCs aiming at meeting the local needs in various markets can not longer hold on to a centralised approach of global R&D, is clearly evident in the case of Bühler and its Indian subsidiary. And in fact, these initiatives taken by the Western MNC, falls in line with what the scholars within the field deem as success factors when innovating for the mid-segment in emerging markets. Ergo, the HQ decision to decentralise R&D and CT, clearly points towards the fact, that Bühler displays executive commitment to the growing emerging market mid-segment (e.g. Immelt et al., 2009). The decentralisation hence also points towards the HQ increasing the autonomy of the local subsidiary in Bangalore (e.g. Govindarajan & Trimble, 2009; Hart & Christensen, 2002; Mudambi, 2011; Jullens, 2013) thereby increasing the regional innovative flexibility (e.g. Zeschky, Widenmayer & Gassmann, 2014). However, the case of Bühler Bangalore shows that this relationship of autonomy and trust evolves over time, and differs depending on the maturity and sales volumes of the business unit.

#### *Upgrade local subsidiaries capabilities*

Awarding the lead locally is crucially interlinked with enhancing the subsidiary's innovative capabilities over time. In the case of Bühler, two main aspects are found to have been contributing to upgrading the subsidiary's capabilities. The first ascends from the HQ assigning expats for establishing new operations, such as the global export platform. As expert knowledge spreads in the unit, operational lead is re-assigned to local successors possessing the capabilities needed to ensure that the operations run successfully. Second, the joint development of the premium PESA and the local lead development of the UltraLine, led to the Swiss management feeling confident that the subsidiary had accumulated the knowledge required to take the lead to develop the two local innovations under review. Furthermore, the local managers appreciated the HQ taking a mentoring role in the development of the Mini-PESA and SmartLine, as it granted them flexibility, yet also provided them with technical support. Therefore, it can be argued that an active collaboration with the HQ leads to knowledge being transferred to the subsidiary;

thereby establishing the innovative capabilities needed locally. Hence, notions of granting access to technological know-how in the MNC (Govindarajan & Trimble, 2009; Zeschky, Winterhalter & Gassmann, 2014b) as enhancing the mid-segment innovation in emerging markets hold true in also the case of Bühler Bangalore.

*Changing subsidiary role, reverse knowledge-flows and decreasing HQ influence*

Bühler Bangalore shows traits of being a 'home-base-exploiting' R&D unit (Kuemmerle, 1997), as the main role of R&D and M2M is to tailor and adapt HQ technologies, such as in the premium PESA or UltraLine, in order to make them more suited to the Indian market. Hence, these organizational units have a stronger focus on the development side, whereas the central R&D units focus on the research side. However, in contrast to Kuemmerle's (1997) findings of the R&D subsidiary, taking either one role or the other, innovations as the SmartLine and the Mini-PESA provide evidence that Bühler Bangalore also takes over some 'home-base-augmenting' responsibilities, as local market knowledge and ideas flow back to the HQ. This is enhanced by the CT department conducting research and developing new innovations for the mid-segment customers. This corresponds to Cantwell and Mudambi's (2005), arguments that the subsidiary R&D unit may take differing roles in the MNC's international R&D network. The decentralisation of R&D and CT also imply that the HQ enabled Bühler Bangalore's increasing importance in the global R&D network. This importance within the global R&D network is further outlined by the fact that Bühler Bangalore acts as a regional hub for developing and exporting products and technologies to other emerging markets, such as the Middle East and Africa, which is proven by establishing the 'export platform'. This in turn, argues for the fact that local knowledge flows back into the global R&D network, displaying traits of taking more of a 'home-base-augmenting' (Kuemmerle, 1997) role. Subsequently, this suggests a dual relationship, whereby an increased maturity of Bühler Bangalore strengthened the subsidiaries bargaining power towards the HQ in terms of receiving the mandate of developing products targeting the local market, as well as other emerging markets, as brought forward by Cantwell and Mudambi (2005). Therefore, a main finding of this study is that HQ commitment to the local market, may also take the form of decreasing its involvement in the development process of mid-segment innovations, by awarding the lead locally and building up a separate organizational unit, and instead take a supporting role granting access to expert, and technological knowledge.

Hence, this study shows that the original assumption provided in the conceptual framework, where it was believed that granting access to technological know-how held at the central R&D unit would facilitate this type of locally based innovation, holds true. However, as outlined in Figure 5.1, one more dimension of the HQ-Subsidiary relationship is added in the revised conceptual framework, whereby the second arrow shows that there is a dual relationship between the two units. Further, the decreasing HQ influence, awarding more autonomy locally is emphasized in the revised framework.

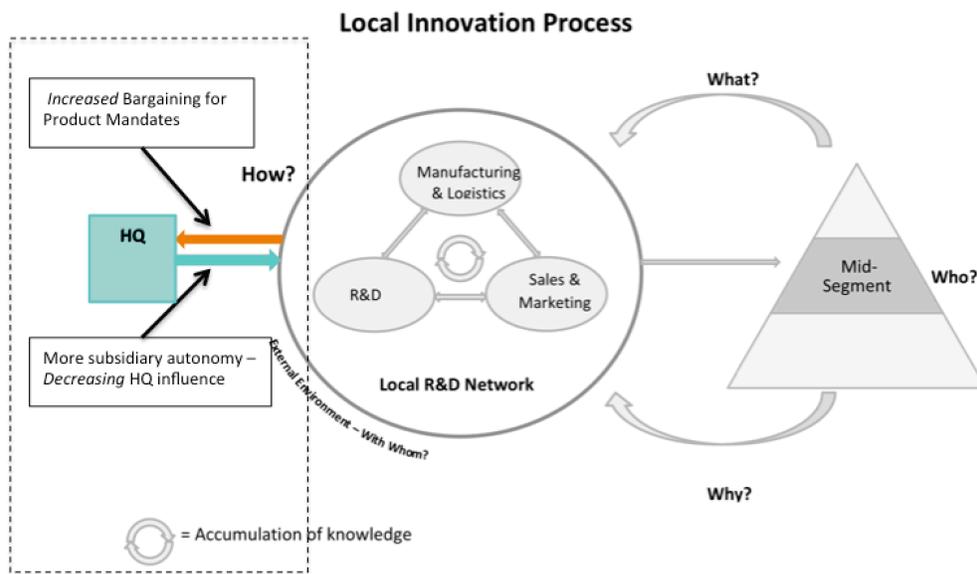


Figure 5.1 Revised Conceptual Framework, Part 1. Compiled by authors

## 5.2 Organization of the Development Process and the Changing role of R&D

### *Changing Role of R&D - Product development more as a collaborative effort*

The development process of the Mini-PESA and the SmartLine has emphasized an increased internal collaborative effort between all functions, where all members of the project team work together closely and contribute to varying intensity and time points. Hence, it can be argued that the role of the R&D unit is changing, which corresponds to the network model of new product development by Trott (2012), who postulates the development process as a series of interlinked activities between all functions, such as R&D, Manufacturing & Sales. This is further underlined by the fact that, the development process of the SmartLine was led by Manufacturing & Logistics, which provides evidence that the stimulus of innovation does not necessarily always have to emerge from the R&D department. In this vein, this study emphasises the importance of establishing a collaboration between R&D and Manufacturing & Logistics during the early

conception phase of the product, as the design of features influences production cost and vice versa. Further, it is suggested that departments like Human Resources, Service or Finance potentially also contribute to create a business model and might take a supporting role in the development process. Lastly, this study also finds evidence suggesting that the local product development team may collaborate with other subsidiaries within the MNC R&D network. This is exemplified by that Bangalore collaborated with Bühler entities in both China and Vietnam, as these had already innovated suitable mid-segment products, which complemented the rice Whitener and Polisher, thereby extending the product portfolio.

*External Collaboration - Important linkages to customers and suppliers*

Regarding the changing role of R&D within the product development, literature has highlighted the importance of external collaboration during new product development (e.g. Trott, 2012), especially when innovating for the mid-segment (Jullens, 2013; Prahalad, 2006; London & Hart, 2004), the data under analysis shows mixed results. For the development of the Mini-PESA, increased external collaboration with customers was found during the idea generation and business plan phase, which mostly took place in the form of fieldwork. This is in line with Immelt et al. (2009) and Eyring et al. (2011), who suggested that local fieldwork conducted by local employees is the most effective way to really create a deep understanding of local customer needs. Further examples of external collaboration is the agreement with SME millers, who already bought the SmartLine, to use them as reference sites for other customers, wanting to see the machine functioning. However, surprisingly, neither of the products under investigation provided evidence for the increased collaboration with external suppliers. Hence, in line with what was highlighted by some managers, there is room for improvement for Bühler to investigate how supplier capabilities can be used to further bring down the cost or even include their considerations into the design process of the features to additionally streamline and speed up the production process.

Based on the foregoing, the initial assumption that the local R&D unit plays a central role when innovating for the mid-segment in emerging markets, as a deep understanding of the local market situation and the customer's needs is required, has been confirmed by this study. However, due to the increased internal collaboration found and the special role of a dedicated local team, like the CT department, the conceptual framework is adapted (see Figure 5.2), by adding Human Resources, Finance and Service as potential support functions to the local R&D network, whereas

in the middle a separate local unit is added exemplifying the CT department and its focus on local innovation targeting the mid-market.

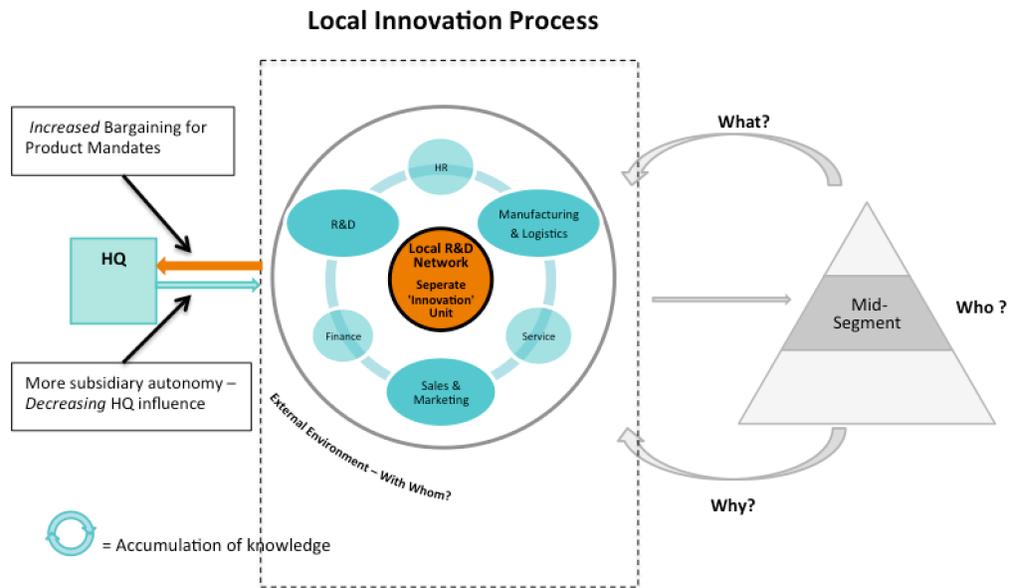


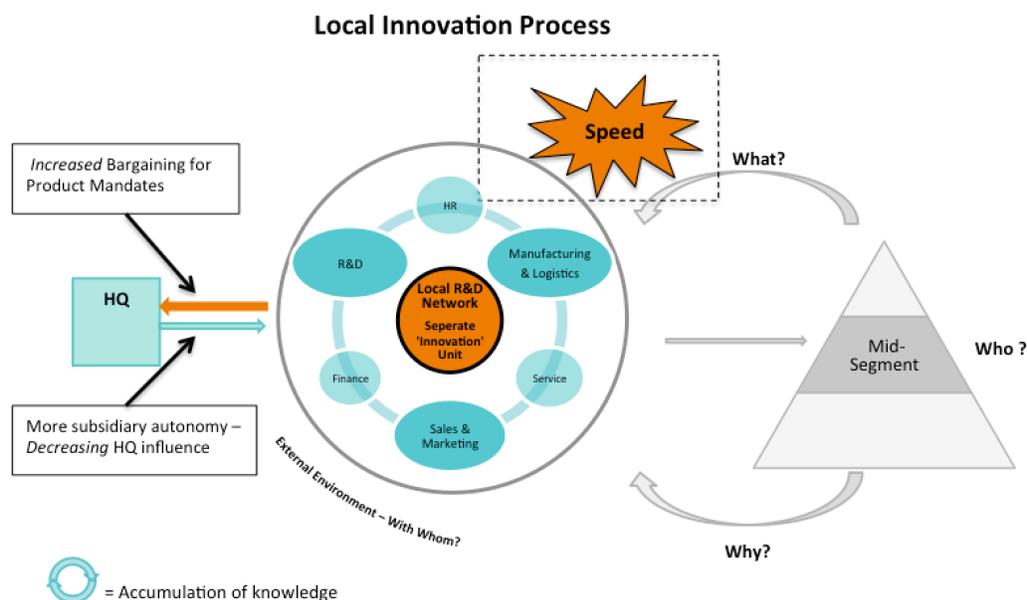
Figure 5.2 Revised Conceptual Framework, Part 2. Compiled by authors

*Why affecting how - The notion of speed, late mover, reactive response, light process*

A key finding of this study related to how the development process itself is organised is the notion of speed. The results of this study show that the request for speed stems from two different sources. First, the mid-segment customers do not plan so much and often request shorter, more flexible delivery times. Therefore, standardizing components and streamlining production is one possibility to shorten delivery times, as well as increased collaboration with suppliers during the development phase. Second, the increased time pressure stems from the fact that Western MNCs like Bühler are late to enter the mid-segment and now must rapidly develop a solution to encounter the increasing competitive pressures. This became particularly evident in the case of the SmartLine, where the lowered investment potential of the premium customers, in combination with the increasing competition in the mid-segment, and the risk of local competitors expanding into the premium-segment, triggered a reactive response. Hence, the standard Market-to-Market process was not followed at all during the SmartLine development, as it would have significantly increased the time-to-market due to the various time-consuming decision gates between the development phases. To encounter the increased time pressure this study identified the following factors. First, several managers call for a 'light' process to speed up local innovation, whereby the time is reduced substantially through increased internal

collaboration between key functions and establishing short decision ways. However, it must be mentioned that some managers also expressed their concern that a ‘light’ development process would collide with the standard Market-to-Market process and may produce too localized solutions, running the risk of building up separate R&D units around the world, who each cook their own soup and potentially reinvent the wheel. Second, awarding the lead locally, is a key element to increase the speed of the development effort, facilitated by local organizational units such as CT, with direct linkages to the top management. Third, both innovations are based on existing technology of a premium product, corresponding to the argument that the majority of mid-segment innovations build on already existing products or solutions (Govindarajan & Trimble, 2012). This reduces the amount of research incurred and in both cases local knowledge about the technology was already available, thereby enhancing the speed-to-market, as was exemplified by the SmartLine, which was developed within 6 months. However, in other cases, it might bear some hidden cost to adapt and scale down an existing technology, as problems might occur along the way, so that in the long run, a clean-sheet approach might have been the better option. Notwithstanding, this is a complex decision, whereas the trade-off between speed-to-market and the cost and time incurred is not always easy to assess.

Therefore, ‘speed’ is added to the revised conceptual framework (see Figure 5.3), in order to exemplify that the request of speed to market influences how the development process is organized, meaning that the ‘Why’ presented in the conceptual framework, actually has implications on the subsequent ‘How’.



*What affecting how - Differing degree of technological and market novelty, cost, time, and risk*

Though both products are based on an existing technology, which speeded up the development process, as discussed before, this study provides further evidence on how the degree of technological and market novelty affects the development process. This becomes evident when analysing the type of innovation the Mini-PESA and SmartLine are attributable to. First, the SmartLine development show clear resemblance to a ‘cost-innovation’ (Williamson, 2010), as it was a team effort of Manufacturing & Logistics and R&D substantially reducing the cost by streamlining the production process and using standardized parts and components, applying the approach of value engineering. Further, the SmartLine targets a less novel market due to Bühler Bangalore’s earlier presence in the upper mid-segment, which further corresponds to Assink’s (2006) and Zeschky, Winterhalter and Gassmann’s (2014a) assumption of such innovations. This implies a lower overall investment in R&D effort, as no extensive market research had to be incurred, nor was there a need to first create acceptance in the market, as the technology is already known by the customers, therefore reducing the associated cost and risk significantly. This explains the quick development of the product through a locally led collaborative effort. In comparison, the Mini-PESA could be argued to show some resemblance to a more ‘frugal innovation’ as it is characterized by higher degree of technological novelty, presenting a complete novel solution to the SME millers, while addressing an entire new market for Bühler (e.g. Sehgal et al., 2010). This is in line with Assink (2006) and Zeschky, Winterhalter and Gassmann (2014b), the Mini-PESA development involved more risk attributed to market acceptance and financing thereby implying increased investment in the R&D effort. Thus, the use of the full-proof Market-to-Market process proved to be a wise choice, in order to ensure the success of the innovation and thereby mitigate the risks connected to the market and technical novelty, while speed is added by holding the lead locally and having the opportunity to conduct in-house testing.

Consequently, in terms of the ‘What’ provided in the conceptual framework, it does show that the type of innovation, has an effect on the ‘How’. Thereby, it maintains the original assumption that the ‘degree of technological and market novelty’ influences the time, cost and risk incurred in the development process and is therefore emphasised in the revised framework (see Figure 5.4 below).

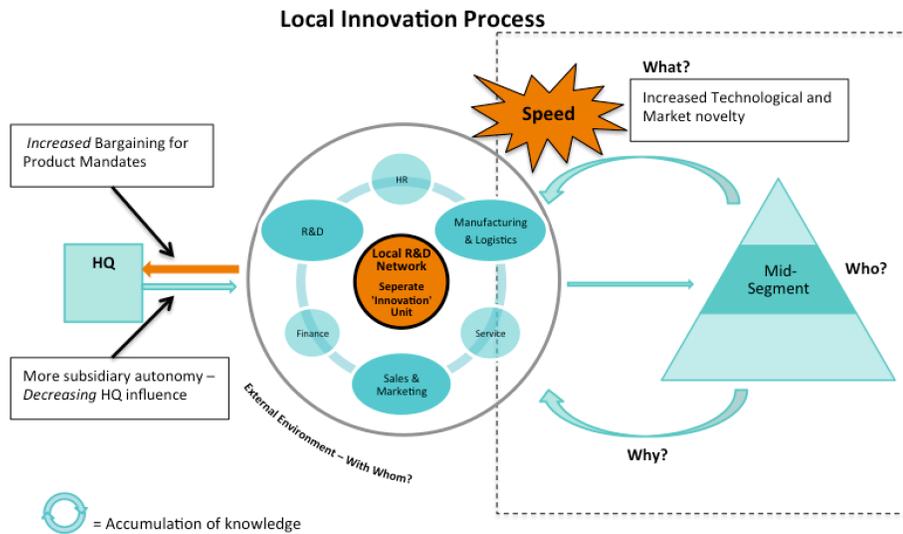


Figure 5.4 Revised Conceptual Framework, Part 4. Compiled by authors

### 5.3 How the Mid-Segment Characteristics Influence the Development Process

Reviewing the two innovations, the SmartLine and the Mini-PESA, it becomes evident that Bühler Bangalore has considered the mid-segment extensively in the development process. The results of this study show that the two mid-market innovations are affordable, yet high-quality products, incorporating less automation, more standardized components and higher accessibility through the utilisation of channel partners. This corresponds with the collective characteristics of the mid-segment product concepts of ‘cost’ (Williamson, 2010), ‘good-enough’ (e.g. Gadiesh et al., 2007), ‘frugal’ (e.g. The Economist, 2010) and ‘disruptive’ (Christensen, 1997) innovations. Bühler has understood that to create an affordable solution for the mid-market, innovation can not only take place on the product side, but has different implications for how the different departments along the value chain organise their activities, as proposed by Assink (2006), and Bhatti (2012). However, this study offers actual evidence on ‘how’ the characteristics of the mid-market influence each value chain activity in particular.

#### *Ambiguous mentality regarding price - Need for market research*

As aforementioned, this study confirms the findings of e.g. Jullens (2013), that to successfully target the resource-constrained customers of the mid-segment, the offer has to be affordable, while not compromising on quality. This is an aspect, which has been highlighted by managers at Bühler Bangalore, as well as by the external perspectives of Business Sweden and IGCC. However, an aspect brought forward by this case study not previously acknowledged by

researchers in the field, is the SME millers ambiguous mentality concerning the price. The findings of this study suggest, that there is a fine line between what they consider excessive pricing and what is 'too-low'. Hence, the price point has to be affordable, offering quality, while not having the image of being the cheapest solution on the market. This implies that Western MNCs like Bühler can build on their aspirational brand value, standing for high-quality solutions, and from a brand positioning point-of-view a slightly higher price may prove beneficial for the Western MNC active in the mid-segment. This is supported by managers at Bühler Bangalore and IGCC who voice, that the segment may also appreciate a price premium on the emerging market mid-segment product, given that the value proposition includes premium features or adds additional value by combining functionalities. To tackle this issue Bühler closely listened to the market and directly worked with the customers to find out which price point would be acceptable for which value proposition. In this line, the need for some sort of financing help was identified, in order to support the SME millers at the beginning of such a big investment like a new machine.

*Moving a niche product to a mass-market - Increased localized focus*

Another characteristic of the mid-market confirmed by this study, is the fact that Bühler changed its business model to enter the mid-market, as the SmartLine is sold as a single machine instead of the full rice production lines (i.e. UltraLine) sold in the premium segment. Hence, moving a niche market product into the B2B mass-market, has several implications on how different value chain activities are organised. During the development process the R&D unit has to take into account that the machine has to be compatible with non-Bühler equipment. In terms of Manufacturing & Logistics, scalability of the production premises was brought forward as a potential limitation, however this could be tackled by increasing the external collaboration with suppliers, outsourcing all standardized components. Hence, putting the focus on producing and sourcing locally, while increasing the responsiveness and flexibility of the supply chain, which is in line with Gadiesh et al. (2007) and Jullens (2013) who postulated that producing and sourcing locally are crucial to reduce cost and compete with established players in the mid-segment. Due to the mass-market characteristics of the mid-segment, a much wider territory has to be served, which has implications on the Sales & Marketing department. Creating awareness and reach, through a more regionalized approach, digging deeper into local preferences and for example translating instruction manuals and advertisement material into local languages, is seen as one of the key factors to serve such a fragmented market. This also implies taking the launch in steps, to

respond to the peculiarities of each region. A key aspect to bring down the sales cost and increase the geographical reach of the SmartLine is the use of channel partners, who are entrenched in the regional B2B environment, facilitating a more regionalized distribution and service system for Bühler, which could not be covered with the regular sales force concentrating on the premium segment. This shows in more detail the adaptation of delivery models and distribution channels suggested by e.g. Anderson and Billou (2007), and Chakravarthy and Coughlan (2011).

*Less technological knowledge - Increased need for training and ease-of-use*

Further, this study highlighted the SME millers, actually need more guidance and assistance, as they are not as technologically knowledgeable as the premium-segment. This characteristic has several implications. First, during the development of the product, engineers must bear in mind that the SME millers do not value automation and high-technology features to the same extent as their premium counterparts. They rather self-administer the machines, as labour is generally much cheaper than investing in sophisticated automation and reporting functions. This comes down to the ease-of-use, highlighted among others by Little (2008). However, this further translates into an increased need for training, suggesting that Western MNCs should adapt consulting and support schemes to actually train the mid-market customers, as well as potential channel partners. Thus, in the case of Bühler Bangalore, this led to Human Resources having an indirect role in the development process, contributing with their knowledge and assistance in the development of the channel partners and customers. Another aspect connected to the lower technological knowledge found in the mid-segment is that the SME millers need often to be convinced by actually seeing the solution, as was alluded to 'to create a see and feel'. This has implications for the Sales & Marketing department, who in the case of the SmartLine used a show truck, as well as building partnerships with existing customers to showcase the machine for other potential customers in the region.

## 5.4 Conceptual Framework Revisited

### Local Innovation Process

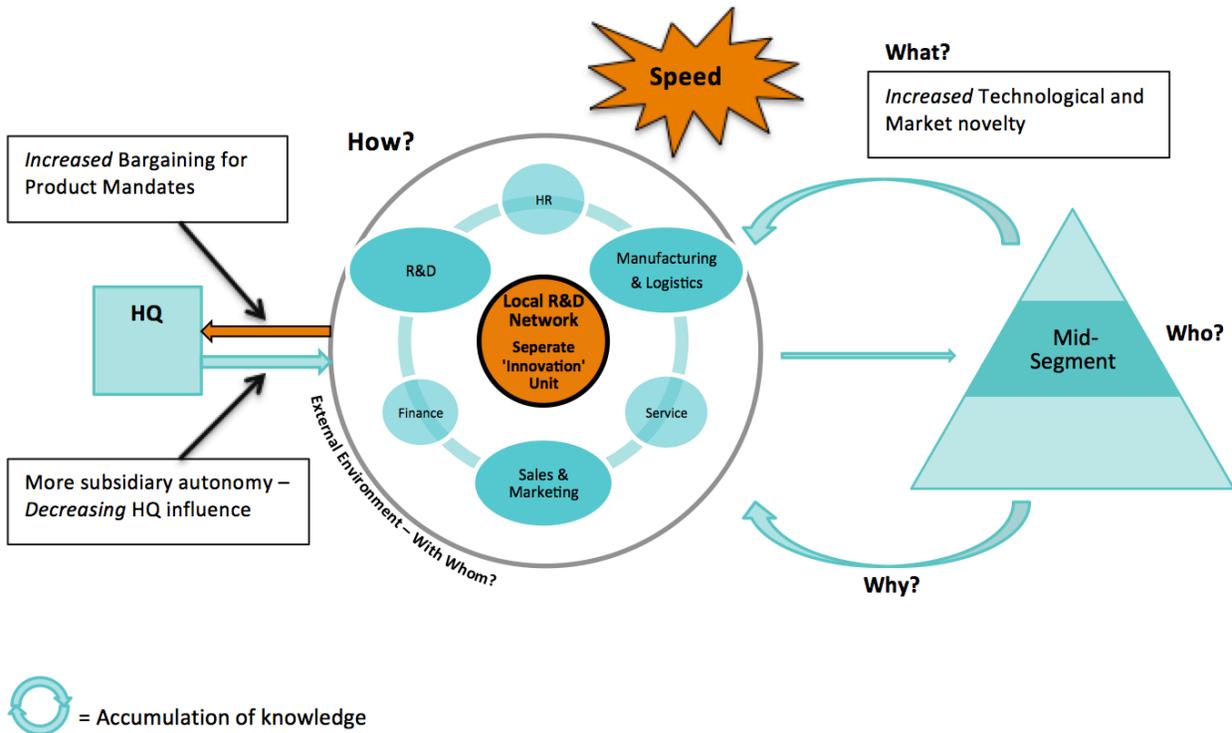


Figure 5.5 Revisited Conceptual Framework. Compiled by authors

In summarisation, as outlined in Figure 5.5 above, this study provided evidence that the influence of the HQ decreases when developing products for the mid-segment, as an important facilitator is to award the lead locally and strengthen the local innovation capabilities. Further underlying organizational factors stimulating local innovation targeting the mid-segment, is granting access to expert and technological know-how, and showing commitment to the local market serving to upgrade these subsidiary capabilities and award more local autonomy and trust. This subsequently leads to increased subsidiary bargaining for product mandates. In terms of the development process, a separate unit to spur local innovation, increased collaboration between the departments, as well as a 'light' process are all factors that according to the results of this study, are deemed to facilitate innovations targeting the mid-segment in emerging markets. This especially, as speed-to-market is crucial for Western MNCs entering the segment. Moreover, the 'What' of the original conceptual framework is amended by the degree of technological and market novelty, to emphasize that the type of innovation, was found to have an impact on how the development process is organised.

## 6. Conclusion and Outlook

This case study investigates *how* Western MNCs organise when innovating for the B2B mid-segment in emerging markets. The findings of this study confirm that MNCs should not only innovate on the product side, but also build entirely new business models targeting the needs of the mid-segment, by applying a network perspective on the product development process. Whereas this aspect has been acknowledged by other recent studies, this study presents new findings on how the market situation, the characteristics of the target segment, and the type of innovation, lead to differing implications on *how* the development process is organised. In this line, one of the most novel findings is the notion of speed, which has not been mentioned earlier in the context of mid-market innovations. Moreover, decentralising the R&D structure and building up a separate local unit focusing on local innovations, as well as awarding the lead of the development process locally, have proven to be important facilitators to stimulate innovations targeting the mid-segment. Thus, this study contributes to the existing literature by providing a more holistic picture on the innovation effort taken by Western MNCs in emerging markets, providing a conceptual model, which can be used as a tool, to exemplify every component to be kept in mind.

### *Findings and theoretical contributions*

This study highlights that the specific mid-segment preferences, and the competitive pressures of the local market do affect how the development process is outlined, involving all functions. Hence, it confirms the results of previous studies that Western MNCs must innovate on three sides, namely the product, the business model and the underlying organizational structure. Thereby taking a business model perspective on the development process, differing from the premium segment. Consequently, this perspective pervades all findings regarding *how* Western MNCs organise when developing innovations targeting the mid-segment in emerging markets.

First and foremost, this study contributes to preceding literature by adding the notion of speed as a crucial factor in the development process, a dimension not mentioned in this context so far. This is found to be stemming from two sides. First, the customer side, due to their need of a flexible supplier delivering the product rapidly, whereby speed is facilitated by standardizing product components, and streamlining production processes. Second, competitive pressures intensify; as local competitors are strengthening their position in the mid-segment, while

simultaneously expanding into the premium segment, requiring a faster reaction by Western MNCs. In this line, this study finds that the type of innovation has differing strategic implications on how companies organise the development process, which corresponds to existent literature. The results suggest that the higher the degree of market and technological novelty, it is advisable to stick to a ‘full proof’ development process. For cost-based innovations, stemming from competitive market pressures, in need for a short time-to-market, a more flexible and speedy ‘light’ process is considered advantageous. However, the findings of this study show that in *both* cases, employing a local lead in the development process, and setting up a separate organizational unit for local innovation reduces the time-to-market tremendously.

Second, this study contributes to existing literature on the organizational structure and operational aspects facilitating innovations targeting the mid-segment in emerging markets. First, the findings suggest that decentralising the R&D structure, and setting up a separate ‘innovation’ unit to spur local innovation are essential when Western MNCs aim to innovate for the mid-segment in emerging markets. That is, as this type of innovations require a local mind-set and deep customer insights. Second, top management commitment from the HQ, especially in the sense of providing access to expert knowledge and technological know-how, seems to lead to increased bargaining for local innovation mandates. These findings therefore suggest a changing role of the innovating subsidiary, whereby increased local capabilities and autonomy subsequently leads to knowledge flowing back from the local unit into the R&D network. This increased local focus points to the HQ potentially decreasing its influence, when developing *‘innovations targeting the mid-segment in emerging markets’*.

Third, internal interdepartmental collaboration is key when conceptualising the idea, as the value proposition can contain elements from all functions (e.g. manufacturing, R&D, logistics, sales, marketing, human resources, service). Therefore traditional models of product development, relying on the involvement of different departments at a certain point of the process, might hinder idea-generation. Further, whereas it is widely recognised in literature that using local components, local sourcing, and local production brings down production cost, this study highlighted the importance of a close collaboration between Manufacturing and R&D from the early start of the project. This is a key area to reduce costs by considering the way it is produced already during the design phase. In this line, this study has shown that approaches such as value engineering might be beneficial to attribute the cost to each feature and combine them cleverly so

that they end up offering the same basic functionality affordable to the resource constrained customers of the mid-segment. However, somewhat contrasting existent literature on the subject, the findings of this study also demonstrates an ambiguous mentality among the mid-segment customers regarding what price points are acceptable, and which are deemed to be ‘too low’. In this regard, Western MNCs should not forgo the value of building on a brand value built on high-quality solutions, thereby offering a smaller price premium of their products.

Fourth, in terms of Sales & Marketing it was proven that awareness and accessibility need careful consideration when targeting customers of the mid-segment. Setting up new distribution channels to increase reach, translate manuals and brochures into local languages and use local endorsement to quicker get a footprint in a market where relationships matter and regional differences are high. This becomes specifically important in large, dispersed countries such as India, wherein Western MNCs are wise to employ a more regionalised approach to increase awareness and accessibility in the mid-segment. Further, whereas the main innovative effort is centred around the R&D, Manufacturing & Logistics, and Sales & Marketing departments, aspects such as the training of customers and channel partners, and recruiting local employees with the right innovative mind-set and capabilities, are facilitated by the Human Resources function. In this line, this case has not shown any innovation on the Service or Finance side, but it was recognised that these are parameters also bearing potential to create interesting value propositions for the mid-segment. Hence, this goes in line with seeing the innovation process as a collaborative effort between all functions and the changing role of the R&D function.

Last, whereas literature has emphasised the importance of external collaboration facilitating mid-segment innovation, this study only found increased external collaboration with customers, and other subsidiaries within the MNC’s R&D network. This might be due to the fact that the two products under investigation are among the first innovations targeting the mid-segment and that the innovations were extremely speedy compared to the premium products. However, this might be an area for future improvement, as for instance involving the suppliers earlier in the development process can provide cost benefits and reduce the time-to-market.

#### *Managerial Implications*

All the organizational and operational factors outlined above, which facilitate this type of innovation targeting the mid-segment, lead to additional managerial implications. First, Western MNCs have to master the challenge of operating two or more business models at the same time:

one for the niche premium-segment and one for the mid mass-market. This might imply, two different development processes, different distribution channels, different extent of training and so on. Second, setting up a separate department in the matrix organization to spur local innovation, such as the CT department at Bühler, is regarded as ideal in order to better capture and understand the needs of the local mid-segment customers. However, this might also imply difficulties in deciding which projects are to what extent led by this unit and which ones are led by the 'traditional' R&D department. This might be mitigated by establishing clear roles, and by spurring a continuous exchange between the heads of departments to keep each other informed about on-going projects and ideas.

#### *Limitations and Future Outlook*

Although this study contributes to a more holistic picture of how Western MNCs organise to develop innovations targeting the mid-segment in emerging markets, it has to be viewed upon in light of a number of limitations. However, these also provide the basis for future research avenues serving to complete the picture of this rather 'novel' area of literature. First, as this study is among the first providing a more comprehensive picture of the topic, it has only scraped its surface. As the development process itself is found to be a complex collaborative effort, wherein interdepartmental information flows interchangeably, and in which actions and decisions are taken simultaneously, there is a need for more extensive studies relating to this process. Hence, in order to overcome this study's limitation attributed to the time restraint, a longitudinal study following the development process from beginning to end is considered fruitful to uncover new areas in the subject. Second, as this study has proven that Western MNCs eventually have to operate two business models at the same time, future research on the organizational implications and challenges this bears, would be of major interest. Third, this study is limited to one Western MNC active in the emerging market, i.e. Bühler Bangalore. Accordingly, a larger sample would be advisable to employ in future studies, to improve the understanding of how firms organise to develop mid-segment innovations. In this line, studying Western MNCs with no earlier presence in the emerging markets' premium-segment would be highly interesting, to identify how these companies organize to target the mid-segment, without relying on local employees and their knowledge. Last, it needs to be borne in mind that this study is limited to its sample, i.e. managers within the case study unit of Bühler Bangalore, and third party objectives of IGCC and Business Sweden. Therefore, this study mainly focuses on aspects from within the case study

unit, and thus not including implications for ‘second-parties’ such as customers, partners, and suppliers. Hence, this calls for future studies attempting to include those local actors since it might open up for new aspects regarding their involvement in the development process. In this regard, the sample of this study has mainly considered the subsidiary perspective, implying that incorporating a larger number of HQ-views might lead to other results. Yet, as the findings have been validated by members from both the subsidiary, and the HQ, it could be argued that this study mirrors the views held by both units.

## References

- Anderson, J., & Billou, N. (2007). Serving the world's poor: innovation at the base of the economic pyramid. *Journal of Business Strategy*, 28(2), 14-21.
- Ansoff, H. I. (1965). *Corporate Strategy*. Corporate Strategy. New York: McGraw-Hill.
- Assink, M. (2006). Inhibitors of disruptive innovation capability: a conceptual model. *European Journal of Innovation Management*, 9(2), 215-233.
- Bartlett, C. and Ghoshal, S. (1989). *Managing Across Borders*. Harvard Business School Press: Boston, MA.
- Bergakker, S. & Speetjens, R. (2015). *The ascent of the emerging middle class*. ROBECO Institutional Asset Management
- Bhatti, Y. A. (2012). *What is frugal, what is innovation? Towards a theory of frugal innovation*. Working Paper.
- Bhatti, Y. & Ventresca, M. (2012). "The Emerging Market for Frugal Innovation: Fad, Fashion, or Fit?" (Working Paper SSRN Number: 2005983).
- Bryman, A., & Bell, E. (2015). *Business research methods* (4.th ed.). Oxford: Oxford Univ. Press.
- Bühler (2014). *Über Bühler. Innovation Partners 2014*. [Online] Retrieved 4<sup>th</sup> of March, 2016 from: <http://www.buhlergroup.com/global/en/about-buehler/innovation-partners-2014/technology-emerging-markets-affordability-robustness-medium-complexity.htm#.VubUmlIfWCR>
- Bühler (2016a). *Annual Report 2015*. Uzwil, Switzerland.
- Bühler (2016b) *Über Bühler*. [Online] Retrieved 4<sup>th</sup> of March from: [http://www.buhlergroup.com/global/de/ueber-buehler/weltweit/buehler-indien.htm#.Vt\\_9KFIfWb8](http://www.buhlergroup.com/global/de/ueber-buehler/weltweit/buehler-indien.htm#.Vt_9KFIfWb8)
- Bühler (2016c). *Ultraline Rice Processing Machines*. [Online] Retrieved 15<sup>th</sup> of May, 2016 from: <http://www.buhlergroup.com/global/en/products/ultraline-rice-processing-solutions.htm>
- Cantwell, J., & Mudambi, R. (2005). MNE competence creating subsidiary mandates. *Strategic management journal*, 26(12), 1109-1128.

- Chakravarthy, B., & Coughlan, S. (2011). Emerging market strategy: innovating both products and delivery systems. *Strategy & Leadership*, 40(1), 27-32.
- Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and corporate change*, 11(3), 529-555.
- Christensen, C. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business School Press, Boston.
- Christensen, C., Craig, T., & Hart, S. (2001). The great disruption. *Foreign Affairs – New York*, 80(2), 80-95.
- Collis, J., & Hussey, R. (2009). *Business research: A practical guide for undergraduate and postgraduate students*. Palgrave macmillan.
- The Economist* (2010). First break all the rules: The charms of frugal innovation. April 15th. *The Economist*
- EY (2011). *Growing Beyond: Innovating for the next three billion*. Ernst & Young.
- Eyring, M. J., Johnson, M. W., & Nair, H., (2011). New business models in emerging markets. *Harvard Business Review* 89(1/2), 88-95
- Gadiesh, O., Leung, P., & Vestring, T. (2007). The battle for China's good-enough market. *Harvard Business Review*, 85(9), 80.
- Gassmann, O., Frankenberger, K., & Csik, M. (2013). *The St. Gallen business model navigator*. Working Paper, University of St. Gallen, St. Gallen, Switzerland.
- Gebauer, H., Fischer, T., & Fleisch, E. (2009). Entering the Chinese mid-market segment: key to long-term success?. *Strategy & Leadership*, 37(5), 31-39.
- Ghauri, P. (2004). Designing and conducting case studies in international business research. *Handbook of qualitative research methods for international business*, 109-124.
- Govindarajan, V., & Trimble, C. (2012). Reverse innovation: A global growth strategy that could pre-empt disruption at home. *Strategy & Leadership*, 40(5), 5-11.
- Guba, E.G & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N.K. Denzin and Lincoln (Eds), *Handbook of qualitative research*. Thousand Oaks, Sage Publications, California.

Hammond, A. L., Kramer, W. J., Katz, R. S., Tran, J. T., & Walker, C. (2007). *The next 4 billion: Market size and business strategy at the base of the pyramid*. World Resources Institute International Finance Corporation.

Hart, S. L., & Christensen, C. M. (2002). The great leap: Driving innovation from the base of the pyramid. *MIT Sloan management review*, 44(1), 51.

Immelt, J. R., Govindarajan, V., & Trimble, C. (2009). How GE is disrupting itself. *Harvard business review*, 87(10), 56-65.

Indiamart (2016). *Atta Chakki Plant*. [Online] Retrieved 15<sup>th</sup> of May, 2016 from: <http://www.indiamart.com/proddetail/atta-chakki-plant-10339840473.html>

Jullens, J. (2013). *China's mid-market: where "good-enough" just isn't*. [Online] Strategy and Business Blogs. Retrieved February 11<sup>th</sup>, 2016 from: <http://www.strategy-business.com/blog/Chinas-Mid-Market-Where-Good-Enough-Just-Isnt?gko=a259c>

Kharas, H. (2010). *The emerging middle class in developing countries*. Working Paper no. 285. OECD Development Centre

Kuemmerle, W. (1997). Building effective R&D capabilities abroad. *Harvard business review*, 75(2), 61-70.

Lindgardt, Z., Reeves, M., Stalk, G. & Deimler, S., D. (2009). *Business Model Innovation: When the Game Gets Tough, Change the Game*. Boston Consulting Group

Little, A. D. (2008). *The BRIC Battle - Winning the Global Race for the Emerging Middle Segment*, NA: Arthur D. Little.

London, T., & Hart, S. L. (2004). Reinventing strategies for emerging markets: beyond the transnational model. *Journal of international business studies*, 350-370

Massa, L., & Tucci, C. L. (2014). Business Model Innovation. In M. Dodgson, D. M. Gann, & N. Phillips (Eds.), *The Oxford Handbook of Innovation Management* (pp. 420–441). Oxford, UK: Oxford University Press.

Merriam, S. B. (2002). Introduction to qualitative research. In Merriam, (Ed) *Qualitative research in practice: Examples for discussion and analysis*, 1, 1-17.

Mudambi, R. (2011). Hierarchy, coordination, and innovation in the multinational enterprise. *Global Strategy Journal*, 1(3&4), 317-323.

Prahalad, C. K. (2006). The innovation sandbox. *Strategy and Business*, 44, 62.

- Prahalad, C. K. (2012). Bottom of the pyramid as a source of breakthrough innovations. *Journal of Product Innovation Management*, 29(1), 6-12.
- Prahalad, C. K., & Hart, S. (2002). The Fortune at the Bottom of the Pyramid. *Strategy and Business* Iss. 26, 54-67.
- Prahalad, C. K., & Mashelkar, R. A. (2010). Innovation's holy grail. *Harvard Business Review*, 88(7/8), 132-141.
- Ramamurti, R. (2012). Competing with emerging market multinationals. *Business Horizons*, 55(3), 241-249.
- Ramdorai, A., & Herstatt, C. (2015). *Frugal innovation in healthcare: How targeting low-income markets leads to disruptive innovation*. Cham: Springer International Publishing.
- Rugman, A., Verbeke, A., & Yuan, W. (2011). Re-conceptualizing Bartlett and Ghoshal's Classification of National Subsidiary Roles in the Multinational Enterprise. *Journal of Management studies*, 48(2), 253-277.
- Sehgal, V., Dehoff, K., & Paneer G. (2010). The importance of frugal engineering. *Strategy and Business*. Iss. 59
- Shankar, V., & Hanson, N. (2013). How Emerging Markets are Reshaping the Innovation Architecture of Global Firms. *Review of Marketing Research*, 10, 191-212.
- Soni, P., & T. Krishnan, R. (2014). Frugal innovation: aligning theory, practice, and public policy. *Journal of Indian Business Research*, 6(1), 29-47.
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long range planning*, 43(2), 172-194.
- Tiwari, R., & Herstatt, C. (2012). *India-a lead market for frugal innovations? Extending the lead market theory to emerging economies*. TIM/TUHH Working Paper, (67).
- Trott, P. (2012). *Innovation management and new product development* (5th ed.). New York; Harlow, England; Financial Times/Prentice Hall.
- UNCTAD, (2005). *World Investment Report 2014: Transnational Corporations and the Internationalization of R&D*. New York: United Nations Publications.
- UNCTAD, (2015). *World Investment Report 2015: Reforming International Investment Governance*, New York: United Nations Publications.

- Williamson, P. J. (2010). Cost innovation: preparing for a 'value-for-money' revolution. *Long Range Planning*, 43(2), 343-353.
- Williamson, P.J., & Zeng, M. (2009). "Value-for-Money Strategies for Recessionary Times." *Harvard Business Review* 87 (3): 66–74.
- Williamson, P. J., Ramamurti, R., Fleury, A. C. C., & Fleury, M. T. L. (2013). *The competitive advantage of emerging market multinationals*. Cambridge: Cambridge University Press.
- Winterhalter, S., Zeschky, M. B., & Gassmann, O. (2015). Managing dual business models in emerging markets: an ambidexterity perspective. *R&D Management*.
- World Bank. (2015). *The World Bank Data Bank*. [Online]. Retrieved 18th of January, 2016 from: <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>
- Yin, R. K. (2014). *Case study research: Design and methods* (5.th ed.). London: SAGE.
- Zeng, M., & Williamson, P. J. (2003). The hidden dragons. *Harvard business review*, 81(10), 92-103.
- Zeschky, M., Widenmayer, B., & Gassmann, O. (2014). Organising for reverse innovation in Western MNCs: the role of frugal product innovation capabilities. *International Journal of Technology Management*, 64(2-4), 255-275.
- Zeschky, M. B., Winterhalter, S., & Gassmann, O. (2014a). From cost to frugal and reverse innovation: mapping the field and implications for global competitiveness. *Research-Technology Management*, 57(4), 20-27.
- Zeschky, M., Winterhalter, S., & Gassmann, O.(2014b) *What is frugal innovation? : Conceptualization and empirical evidence*. Valencia: European Academy of Management Annual Conference. 28.
- Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of management*, 37(4), 1019-1042.

# Appendix 1

## A. General Interview Guide for Managers in Bühler Bangalore\*

### Introduction and general overview

- Which department do you work in? What is your role?
- Which responsibility did you have developing the a) premium PESA / Mini-PESA b) UltraLine/ SmartLine Rice processing machines?

### Target Segment Characteristics & Product Characteristics

- How would you separate the mid- and BOP-segment from the premium-segment?
- What are the key factors to keep in mind when innovating products for the below premium-segment?
- What type of customers does the a) premium PESA/Mini-PESA b) UltraLine/SmartLine Rice processing machines target and how do their needs differ from a premium customer?
- What are the main differences between the mid-segment product and its premium counterpart?
- What would you consider the most innovative feature of a) Mini-PESA b) SmartLine Rice Processing Machines?

### Product Development Process

- What factors were the main reason for the decision of developing the a) Mini-PESA b) SmartLine Rice?
- How does the development process of the a) premium PESA/Mini-PESA b) UltraLine/ SmartLine Rice processing machines differ?
  - How did the Indian engineers collaborate?
  - Why was the a) Mini-PESA b) SmartLine Rice processing machines developed locally and not also by the HQ?
  - In this respect, is the role of Bühler Bangalore changing?
- From which departments was the project team and the steering committee compiled to develop the a) Mini-PESA b) SmartLine Rice processing machines?
- To what extent did the development of the a) Mini-PESA b) SmartLine Rice processing machines rely on existing technologies held by the Bühler HQ?
  - How did the collaboration with the HQ work?
- What were the challenges when developing the a) Mini-PESA b) SmartLine Rice processing machines?
- Was there any kind of external collaboration involved when developing the product a) Mini-PESA b) SmartLine Rice processing machines?
- To what extent did you consider competitors when developing the a) Mini-PESA b) SmartLine Rice processing machines?

### Implications

- What is important to consider in terms of distribution/sales/service/ marketing/ production when targeting the mid- compared to the premium-segment?
- What are the main challenges for your department when developing the a) Mini-PESA b) SmartLine Rice processing machines?
- How important do you consider local management to facilitate successful innovation? Is it even more important when innovating products? For the mid-segment?
- Which factors led to the fact that the a) Mini-PESA b) SmartLine Rice processing machines were developed locally?
- To what extent is this linked to the innovative capabilities of Bühler Bangalore?
- Is there anything from an organizational perspective that could enhance this type of mid-segment innovations?

### **Final Questions**

- What have you learned from your experience with the a) Mini-PESA b) SmartLine Rice processing machines that you can apply to future innovations targeting the mid-segment?
- What would you have done differently?
- Is there anything else relevant to this topic we have not talked about?

\*Adapted depending on department/role of the Manager

## B. Interview Guide Business Sweden and Indo-German Chamber of Commerce

### **Introduction and general overview**

- Which department do you work in? What is your role?
- In what way do you support foreign companies who want to enter the Indian market?

### **How foreign companies act in the Indian market**

- What do you believe makes India an attractive location for foreign companies to enter?
- Which industries of the market do you believe is mostly targeted by foreign multinationals? Why?
- Which segments of the market do you believe are mostly targeted by foreign multinationals? Why?
- How would you describe the emergence of local multinational companies? What are their main success factors?
- What do you think are the reasons for Western MNCs ignoring the below premium-segment for so long?

### **Characteristics of the below premium-segment**

- How would you separate the mid- and low-segment from the premium-segment?
- How does the foreign organizations approach differ from local organizations when targeting the below premium-segment?
- What factors do you believe are most challenging for foreign companies when targeting the below premium-segment?
  - What are the most common mistakes?
- What do you believe are the main factors for success when foreign companies targeting the below premium-segment?

### **Innovation in India**

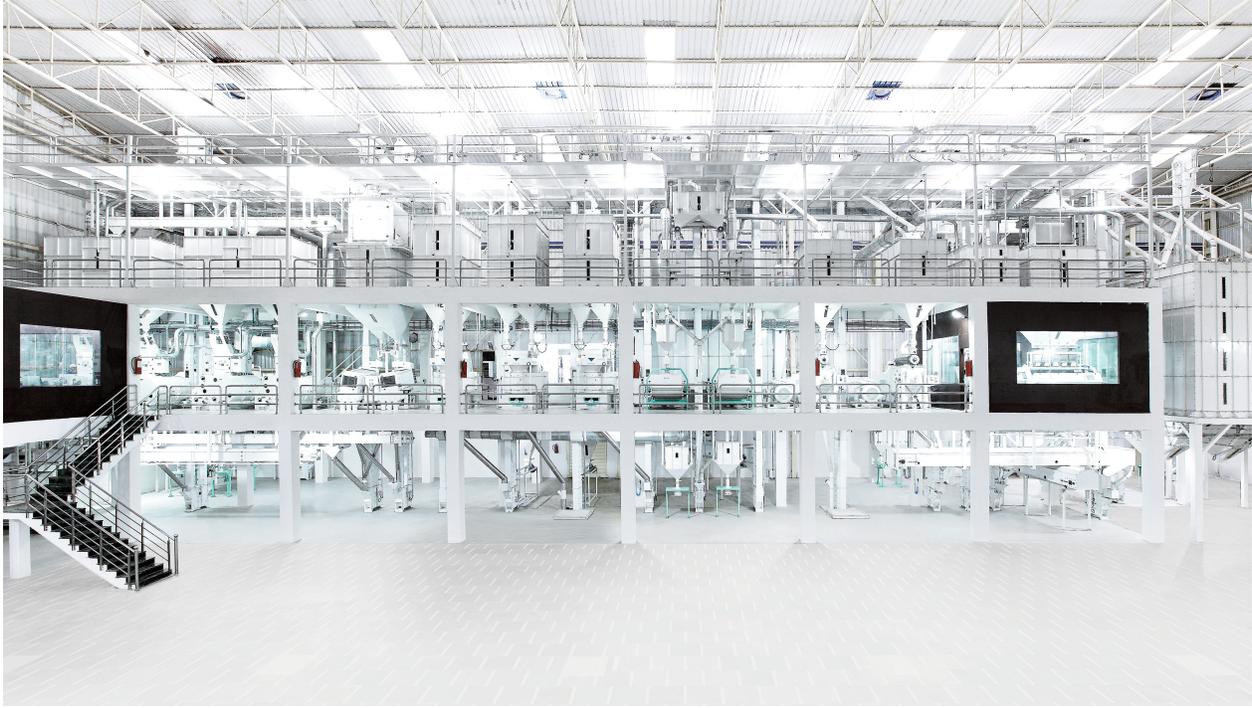
- To what extent do foreign multinational conduct R&D related activities in India?
- How high would you consider the degree of local adaptation of innovations developed by foreign multinationals in India?
- How important do you consider local employees in management positions?
- To what extent do you believe the foreign multinationals innovate specifically targeting the below premium-segment?
- Could you give an example of a successful innovation of a Western MNC targeting the Indian mid-segment?
- What are the key factors for foreign multinationals to keep in mind when innovating products for the below premium-segment?
- How would you suggest the Indian mid-segment will develop in terms of competition during the next 3-10 years?
- How do foreign multinationals interact with the local environment during the innovation development process?

**Final Questions**

- How do you believe the Indian market for foreign multinationals will evolve in the future?
- Is there anything else relevant to this topic we have not talked about?

# Appendix 2

## A. Premium UltraLine Rice Processing Plant



Picture 1. Premium UltraLine Rice Processing Plant (Source: Bühler 2016c)

## B. SmartLine Rice Processing Machines

C.



SmartLine Rice Processing Machines, SmartWhite Rice Wholesaler & Retailer  
Polish Rice Source: B. (Bühler), Manager D)

Chakki  
Mill Grinding  
Small Chakki Atta Mill



Atta  
Stones &



Picture 3. Chakki Atta Mill Grinding Stones (Source: Presentation, Manager S)



Picture 4  
D. Big Mechanical

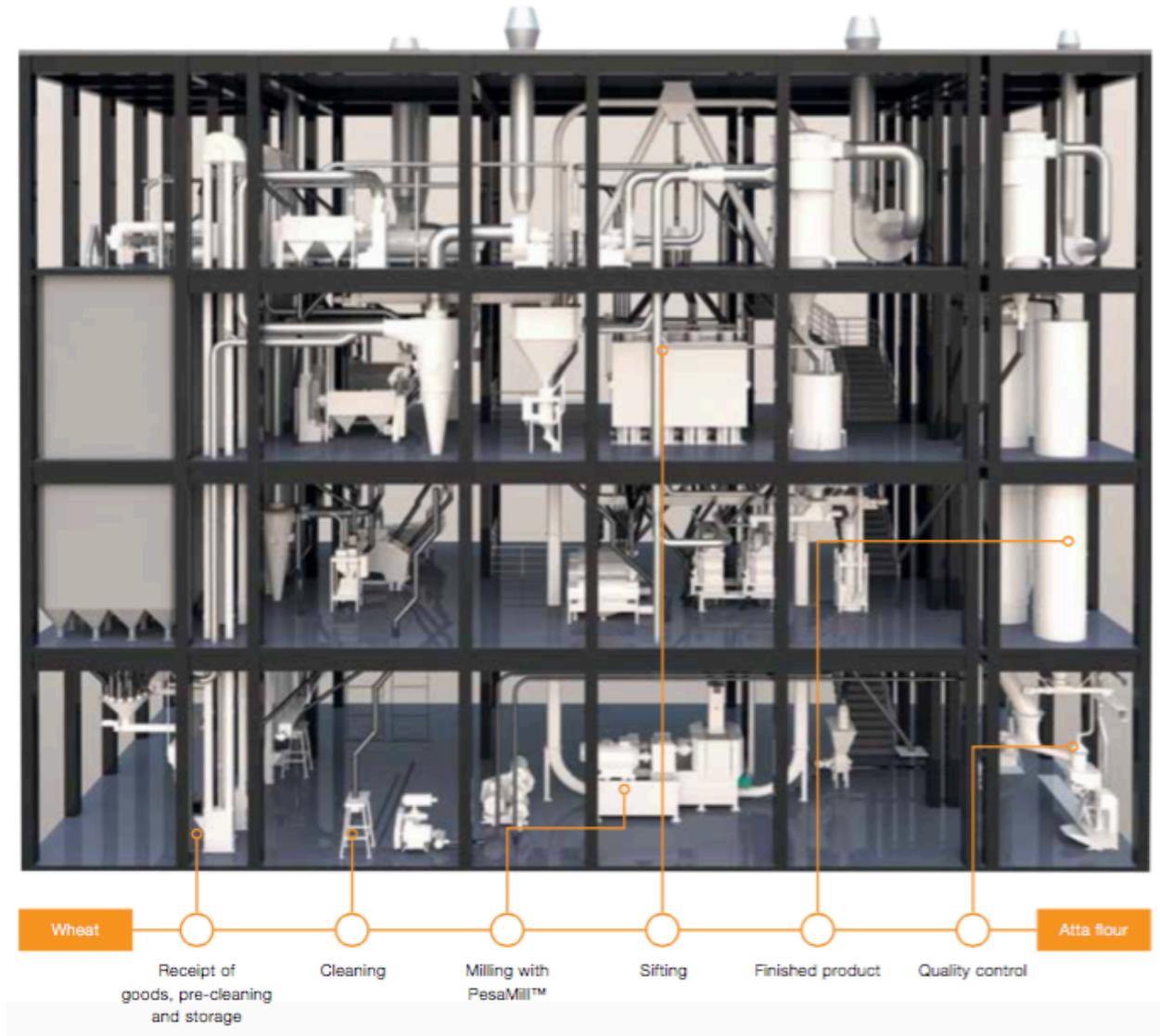
Source:  
Atta Chakki Plant

Picture 5. Big  
Mechanical Atta Plant  
(Source: Indiamart,  
2016)



E.  
Atta

Premium PESA  
Mill Plant



Picture 6. Premium PESA Atta Mill Plant (Source: Brochure, Manager D)

# Appendix 3

	Premium UltraLine	Premium PESA	SmartLine	Mini-PESA
<b>Market Situation</b>	Consolidation of the market; trend towards higher capacity	No existing solution available; complete technological novelty	Triggered by competitive and market pressures; speed to market	No existing solution available in the mid-segment
<b>Target Segment</b>	High Capacity, export based rice milling companies in the premium segment	High capacity atta flour milling companies in the premium segment	Highly fragmented customer base in the lower capacity segment; SME millers	Highly fragmented customer base in the lower capacity segment; SME millers
<b>Competition</b>	Emerging local competition; Japanese MNC	Fragmented local competition producing Chakki Mills	Local competition dominating the mid-segment	Fragmented local competition producing Chakki Mills
<b>Date of Launch</b>	Beginning of 2013	Beginning of 2015	Beginning of 2016	expected launch End 2016
<b>Development Time</b>	3 years	> 5 years	6 months	1 year currently
<b>Product Mandate</b>	Lead held locally by Bühler Bangalore	Lead held centrally by Bühler Uzwill	Lead held locally by Bühler Bangalore	Lead held locally by Bühler Bangalore
<b>Project Team</b>	Local project team, supported by Bühler Braunschweig (Germany) with technological knowledge	Swiss project team holding expert knowledge in milling, supported by local team at Bühler Bangalore	Local project team, focused around M&L	Local project team, focused around CT
<b>Market Research</b>	Extensive market research, with 4-5 years applied research and development	Extensive market research, with 4-5 years applied research and development	Limited market research	Extensive market research conducted locally; field work
<b>Development Process</b>	Following the standard M2M process	Following the standard M2M process	Not following the standard M2M process at all; collaborative effort	Following the standard M2M process
<b>Degree of Technological &amp; Market Novelty</b>	Existing technology, targeting a for Bühler new market (i.e. the high-capacity premium segment)	Completely new technology, targeting a for Bühler new market (i.e. the high-capacity premium attar flour segment)	Built on an existing technology; though a different approach was applied during the development process (i.e. 'value engineering'); targeting a for Bühler relatively new market (i.e. mid segment millers)	Built on an existing technology; though a different approach was applied early in the development process (i.e. bottom up); targeting a for Bühler new market (i.e. mid-segment millers)
<b>Internal Collaboration</b>	Collaborative development between the R&D unit at Bühler Bangalore and the rice experts at Bühler Braunschweig. Intensive research incurred.	Collaborative development between the milling experts at Bühler Uzwill and the local M2M/ R&D Team at Bühler Bangalore. Intensive research incurred.	Increased internal collaboration between R&D and M&L	Increased internal collaboration and in-house testing
<b>External Collaboration</b>	n/a	External collaboration with the Central Food Technological Research Institute, quality testing and guarantee	No evidence of external collaboration due to short time to market	Increased external collaboration with the customers during the development of the business plan
<b>Organizational Structure &amp; HQ-Subsidiary Relationship</b>	Building up local subsidiary capabilities; Transfer of the global Rice Milling R&D unit from Braunschweig to Bangalore in 2008	Building up local subsidiary's capability through the joint development effort; as well as the Establishment of the application centre in 2012	Increased trust and autonomy in the local subsidiary, due to the capabilities built up during the previous development of the premium product	Decentralization of the CT department in 2012 to spur local innovation; increased trust and autonomy in the local subsidiary, due to the capabilities built up during the previous development of the premium product

Table A3.1 Differences in the development process of mid-segment products compared the premium counterparts. Compiled by authors