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# Business model innovation processes in large corporations: insights from BASF

Stephan Winterhalter, Tobias Weiblen, Christoph H. Wecht and Oliver Gassmann

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## 1. The challenge of innovating business models

Companies currently are under constant pressure to generate, choose and run multiple business models simultaneously to master diversification and extend into new markets (Sabatier *et al.*, 2010; Winterhalter *et al.*, 2016). Business model innovation (BMI), which defines the new logic that creates and captures value, is characterized as a new form of innovation distinct from, but often connected to, product and process innovation (Massa and Tucci, 2014). BMI is linked to positive outcomes such as competitive advantage (Amit and Zott, 2012; Mitchell and Coles, 2003) and disruptive innovation (Markides and Sosa, 2013) and also seen as a key ingredient in the successful commercialization of new technology (Baden-Fuller and Haefliger, 2013; Chesbrough and Rosenbloom, 2002).

Despite corporations' need to achieve BMI, there is a paucity of knowledge on how this process can be implemented and managed in a corporate environment (Björkdahl and Holmén, 2013). Fundamental questions remain unanswered:

- Q1. When should BMI be initiated?
- Q2. How does the BMI process relate to established technology innovation processes?
- Q3. Who should be responsible to drive BMI within an enterprise?

In this article, we present first-hand insights on how BASF, a leading chemical company, answered these questions for itself and how the company established organizational structures and processes to foster BMI.

## 2. Background: corporate business model innovation

### 2.1 What is a business model innovation?

A business model describes the design or architecture of an organization's value creation, delivery and capture mechanisms (Teece, 2010). Frequently, the description of a business model is broken down into several components. For the purpose of this study, we used Matzler *et al.*'s (2013) conceptualization which consists of five components:

1. *Value creation logic*: This includes the activities and processes to produce and market the product or service.
2. *Product and service logic*: This includes the resulting product or service offering.
3. *Marketing and sales logic*: This includes the way customers are attracted.
4. *Profit formula*: This includes the revenue and cost models which describe how the organization earns money.
5. *Positioning*: This includes the organization's differentiated positioning on the market.

**“Overall, there is a wide consensus that BMI is a new class of innovation which is different from other forms.”**

At root, a BMI can be defined as a reconfiguration of one or more of these components, resulting in a novel or even unique way of doing business.

Overall, there is a wide consensus that BMI is a new class of innovation which is different from other forms, such as product or process innovation (Baden-Fuller and Haefliger, 2013; Björkdahl and Holmén, 2013; Massa and Tucci, 2014). BMIs are characterized as being more complex to achieve, yet potentially more rewarding than other forms of innovation. However, managers often struggle to develop and implement new business models in corporate practice, as they often conflict with an organization's existing business model (Chesbrough, 2010). Therefore, from the perspective of a given organization, any business model reconfiguration that results in a “new to the firm” business model qualifies as a BMI, as it means that the organizational challenges and rigidities need to be successfully overcome.

### *2.2 How does business model innovation relate to other forms of innovation?*

One approach to understand the relation of product innovation and BMI is their sequential order. Typically, the largest portion of corporate innovation efforts goes into the research and development of new technologies and products (Johnson *et al.*, 2008). Subsequently, other forms of innovation – such as BMI – may extend the lifecycle of the product or technology by shifting competition to fields such as efficiency or marketing (Massa and Tucci, 2014). There is, however, a second view on the relationship between technological innovation and BMI. Chesbrough and Rosenbloom (2002) highlight the importance of developing the right business model for the commercial success of a new technology, which implies a concurrent and aligned development of technology and the corresponding business model.

For practice, this ambiguity raises questions concerning the organizational implementation of a BMI process. Assuming an established and pre-existing stage-gate process of product and technology innovation, how early should BMI come into play? Should it be integrated into the process, precede it or be performed independently? How is alignment or handover achieved between the two?

### *2.3 How do corporations implement business model innovation processes?*

Unlike technology and product innovation, where stage-gate based processes are a *de facto* standard, the practice of BMI has not achieved this level of maturity yet. Checklist-style “steps to business model innovation” are frequently proposed in management literature but at a rather high level and with unclear derivation (Johnson *et al.*, 2008; Teece, 2010). Only a few scholars have studied the BMI process empirically, identifying four different stages in a corporate and start-up context (Frankenberger *et al.*, 2013; Sosna *et al.*, 2010).

BMI's complex relationships not only with technology and innovation management but also with corporate strategy and information systems make it difficult to locate the task in large organizations. Top management must take on different roles, from supervisor to architect, depending on the scope of the BMI. The idea that the chief executive officer (CEO) should lead BMI efforts in large corporations is a notion frequently found in the literature (Govindarajan and Trimble, 2010). Against the backdrop of a large multinational

corporation, this suggestion seems a bit simplistic because dedicated teams and processes are required to support the CEO or other top management sponsors in this task. Our study helps to shed light on these open points of how to anchor BMI in large corporations.

### 3. Studying business model innovation processes at BASF

We adopted a multi-case study design to investigate how BASF uses a newly developed, specified process to foster BMI. To do so, we engaged with *perspectives*, the internal service unit (ISU) within BASF in charge of facilitating projects through a BMI process. Particularly, we draw upon observations of a total of six projects that were guided through this process. Two of the authors attended all process steps, meetings and workshops scheduled as part of the BMI process. Additionally, we triangulated this observation data with internal documents and interviews with managers within BASF. While the process was standardized as such, it became apparent during our observations that the *perspectives* coaches tailored the process to each project. The *perspectives* coaches chose a sample of six diverse innovation projects (in terms of industry, time and maturity) that they thought would profit from adopting the new BMI process. Our findings are based on the cross-case analysis of all six projects. The six innovation projects we analyzed are presented in more detail in [Box 1](#) entitled “Six cases of BMI at BASF”.

### 4. Three types of business model innovation processes

Our research revealed significant differences in how the BMI process was executed in the six instances. There are three sub-types of BMI processes ([Figure 1](#)):

1. BMI processes of Type A (back-end BMI) are pure business innovations where the logic of an existing business is altered without a new product or technology.
2. Type B (front-end BMI) is a BMI process for technologies or product innovations that are in the final development stage with a clear target market.
3. Type C (fuzzy front-end BMI) are BMI processes for radical early-stage technology developments with an undefined target market.

#### 4.1 Back-end process (Type A): pure business innovations

Cases 1 and 2 started from existing businesses that already had business models in place. Triggered by the respective market positions, which were not satisfactory for BASF, management sought to alter the industry logic by reorganizing existing value propositions and value creation processes. The time horizon for market launch was under two years for both projects. The loci of the BMI projects were the operational business units active in these market segments.

The BMI process Type A ([Figure 2](#)) comprises three major steps. In the framing stage, the BMI team seeks to gain an in-depth picture of the current competitive situation in the market. This includes value chain analysis and the analysis of business models already in place. Not only was this analysis done for BASF's business models but also for competitors' business models. With the clear market picture in mind, the BMI team conducted an idea generation workshop to transfer the generated knowledge into new business model ideas.

**“Top management must take on different roles, from supervisor to architect, depending on the scope of the BMI.”**

### Box 1. Six cases of business model innovation at BASF

BASF SE, headquartered in Ludwigshafen, Germany, is the world's leading chemical company, with production in 7 major sites and 376 additional production sites worldwide. In 2015, the company posted sales of €70bn, an operative income before special items of over €6.2bn, and employed more than 112,000 employees. The group is divided into five business segments, in which 13 divisions bear operational responsibility and manage a total of 63 business units in four regions. Apart from the operating business units, there are 3 corporate divisions, 6 corporate departments and 11 competence centers, which provide services for the BASF Group in areas such as finance, communications, human resources, research, engineering, site management, environment and health and safety. The following paragraphs describe the six BMI projects under study.

#### *Case 1: construction*

Case 1 was located in the construction industry. The aim of the BMI project was to identify and implement a new business model based on existing solutions and products from the corporation's portfolio for construction businesses. BASF had been active in this industry for a long time, but the involved business units felt increasing pressure from local and international players. The BMI project was started to advance positioning in the market and to improve the overall customer value proposition by integrating and re-arranging formerly isolated offerings.

Main BM components affected compared to existing traditional BASF operations: Product and service logic.

#### *Case 2: care chemicals 1*

Case 2 was a BMI project in the care chemicals division. As in Case 1, the target was to identify and develop new business models without new technological or product development, using only existing solutions. As a supplier in this segment, BASF aimed for the development of business models in collaboration with other suppliers to create integrated business models for joint customers in the value chain. The project intended to improve the suppliers' overall market position and to ensure that more value was captured by the group of suppliers.

Main BM components affected compared to existing traditional BASF operations: Marketing and sales logic, profit formula, positioning.

#### *Case 3: care chemicals 2*

Case 3 was located in the care chemicals division too. Based on a product innovation developed by BASF, its direct customers could save costs on raw materials. Applying the product innovation would allow them to increase production efficiency. The project was intended to alter BASF's existing business model in this segment to capture a significant share of the newly created value.

Main BM components affected compared to existing traditional BASF operations: Product and service logic, profit formula.

#### *Case 4: mining*

The BMI project studied in Case 4 took place in the context of the mining industry. A new technology developed by BASF enabled its customers to attain a higher yield from their mining operations. The project team sought a way to give mining customers a new value proposition to create and capture more value. The technology is currently in its last development stage and is being finalized according to requirements identified during the BMI process.

Main BM components affected compared to existing traditional BASF operations: Value creation logic, product and service logic, profit formula and positioning.

In the last step, the ideas were rated and prioritized by the BMI team before an elaborated business model concept was developed. Transformed into a full business case, the BMI concept was presented to top management.

In total, the two observed BMI projects took three and six months from framing to concept development, respectively. The center of the process was a workshop block (2.5 days), where the results of the framing analysis were discussed and refined (Day 1), idea generation was carried out (Day 2) and business model ideas were selected and enriched (Day 3). Prior to the workshop block, the BMI team prepared extensive information necessary for framing and, subsequent to the workshop, transformed the BM concept into a business plan. The BMI team consisted of representatives from the business units involved, supported by selected participants from outside the business units during the workshop block. After the approval for the BM concept by management, the BMI team began implementation.

Box 1. (continued)

Case 5: Energy 1

In Case 5, a BMI project triggered by a technological breakthrough gives the company the possibility of a new-to-the-world value proposition in the energy sector. The BMI process was initiated to ensure market fit of the technology in an early stage of technological development and to avoid the “molecule seeks market” problem – the development of a new technology without a proper market and business model in place. Findings during the BMI process (e.g. strategic and ecological considerations) influenced further technological development.

Main BM components affected compared to existing traditional BASF operations: Value creation logic, product and service logic, profit formula, positioning.

Case 6: Energy 2

Case 6 studies another BMI project spurred by a technological breakthrough in the energy sector. As in Case 5, the adoption of the BMI process in the early phase of development was initiated to ensure that the technology was developed with a market in mind. Findings during the BMI process (e.g. strategic considerations with regard to the business model and intellectual property) influenced further technological development and vice versa. Based on the BMI-enhanced development process, BASF started not only to implement the technology but also to define it as a platform-technology for future product developments.

Main BM components affected compared to existing traditional BASF operations: value creation logic, product and service logic, profit formula and positioning.

Note: Information has been taken from <https://irpages2.equitystory.com/download/companies/BASF/Annual%20Reports/DE000BASF111-JA-2015-EQ-E-00.pdf>, and the case study has been approved by two BASF representatives

Figure 1 Overview of BMI Processes

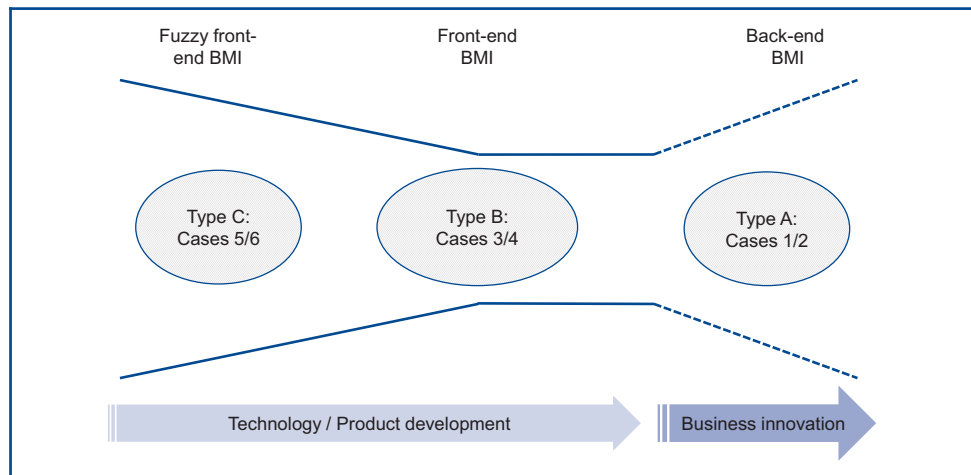
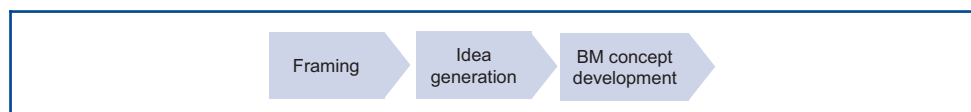


Figure 2 Type A: Back-end BMI process



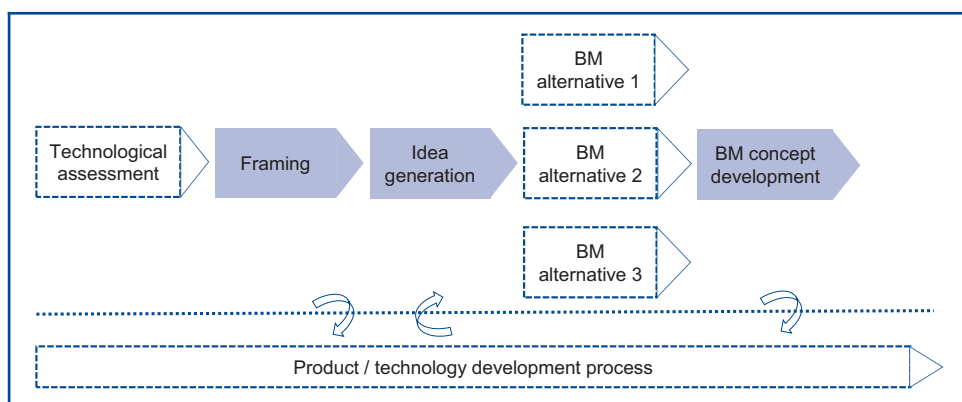
#### 4.2 Front-end process (Type B): new business models for new products in existing markets

Cases 3 and 4 resulted from product or technology innovations developed by BASF which could be introduced to existing markets. If they were implemented using the current industry logic, however, the innovations would be of rather low attractiveness, as only a small portion of the additional value created could be captured by BASF. Consequently, the aim was to change the business logic by means and for the purpose of the new product launch. In Case 3, the product was fully developed and ready for market launch. The technology in Case 4 was in its final development stage, undergoing pilot plant testing. For Case 3, the time horizon for market launch was under two years, and the BMI project was located in the operational business unit. In Case 4, the target time to market launch was under five years, and the *locus* of the BMI project was an internal venture founded to market the technology developed in corporate research.

In terms of process, this Type B BMI process (Figure 3) incorporates the same three core steps from BMI process Type A, yet adapted and with additional modules. For reasons of space, we extend process Type A and only present the differences with Cases 3 and 4. In both cases, the framing phase was preceded by an additional module, which we term “technological assessment”. The sales and marketing representatives within the mixed BMI team had to become familiar with the technology base of the product (technical possibilities, core of the technical improvements) to enable the development of business model ideas. This not only forced R&D managers to formulate the value of an invention in business terms but also served as the common ground for BM related questions from business to research. In Case 3, this module was executed once; in Case 4, it was performed twice involving different people and different foci.

The subsequent framing and idea generation was carried out the same way as in BMI process Type A. However, in contrast to Type A, the idea generation phase in process B resulted in several business model alternatives from which three were selected and elaborated to concepts. These alternatives usually were the result of a “mix and match” approach. Doing so, ideas were initially developed for different BM components separately and then mixed in different combinations. Depending on the business specifics in the respective case (e.g. positioning, competition, value chain configuration, customer structure), these combinations could be mutually exclusive or combinable. In Case 4, because the technology was not yet finally developed, there were three kinds of interactions between the technology development process and the BMI process. *First*, questions raised during framing such as “can our technology do that?”, “can we do this better than our competitors?” and “we should check this in the lab using other materials” spurred new R&D efforts in the technology development process. *Second*, new insights

**Figure 3** Type B: Front-end BMI process



**“With the clear market picture in mind, the BMI team conducted an idea generation workshop.”**

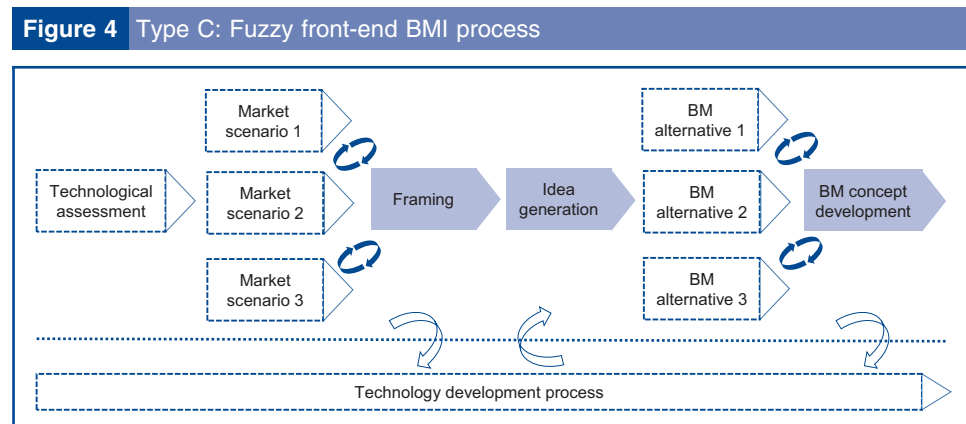
from R&D (between framing and idea generation) narrowed down the solution space for idea generation. Specifically, certain business model alternatives were excluded for technological reasons. *Third*, BM ideas developed in idea generation influenced the final developments of the technology. As a last step, the business model concepts in the form of a business case were presented to management. After the approval for at least one of the concepts, the BMI team from the business unit (Case 3) and the internal venture head (Case 4) began implementation.

In total, the BMI projects took 6 months for Case 3 and 12 months for Case 4 from technological assessment to concept development. Instead of a workshop block in the middle (as in BMI process Type A), this process consisted of a series of four single workshops within that time frame: technological assessment (1 Day), framing (1 Day), idea generation (1 Day) and concept development (1 Day). The BMI teams were mixed and either business-based and supported by selected R&D representatives (Case 3) or R&D-based and supported by selected business representatives (Case 4).

#### 4.3 Fuzzy front-end process (Type C): new markets for breakthrough technologies

Cases 5 and 6 differ substantially from the other four in that both cases are rooted in technological breakthrough innovations. Even though BASF had not been active in the target markets before, the potential value of these innovations was identified right from the point they were developed in the lab. Nevertheless, great uncertainty prevailed about how the technologies could be marketed and which market to tackle. Because of a scarcity of market information, many decisions in these processes were taken based on well-founded assumptions and scenarios rather than in-depth market intelligence. In both cases, the technological development was in its early stage with a time horizon for market launch of 5 to 10 years. Case 5 is located in a business development department within an operational business unit; Case 6 is located in a technology incubator.

This BMI process Type C (Figure 4) builds on the Type B process with two major adaptations. *First*, because no specific market is defined, the “technological assessment” prepares the decision on which market to tackle. This question can be relatively narrow (Case 6), where a market segment needed to be determined within the already defined



market (e.g. energy generation vs energy trade) or rather broad (Case 5), where decisions needed to be taken between major markets (e.g. energy vs health care vs automotive). Both cases developed several market scenarios, and, after thorough analysis, one was chosen for framing and idea generation. In both cases, this process of identifying and selecting the right target market was very time-consuming. Market information, when available, had to be gathered, processed and consolidated before the respective market scenario for idea generation could be selected. The remaining market scenarios were kept as fallback options in case the chosen market proved impossible or inappropriate during the BMI process, and they were also possible future markets.

*Second*, the business model ideas generated covered a broad range because a market that is yet to be established offers vast possibilities for first movers. After a prioritization and condensation of all ideas into two to three alternatives, the models were presented to top management in an interim presentation, ensuring a fit with corporate strategy before elaboration of the final BM concepts. Interdependencies between the technology innovation process and the BMI process were similar but stronger in nature than in the Type B process. For example, during the technological assessment of Case 6, several intellectual property gaps were identified which led to the formulation of an intellectual property strategy and the strategic use of patents to protect future business models. Moreover, a potential substitution technology was identified in the same workshop, triggering increased R&D efforts to close that gap. Later in the process, two business model alternatives developed required additional R&D efforts to validate whether they were feasible in terms of technology.

The BMI teams were R&D-based, supported by selected internal and external business representatives with specific market knowledge. The overall duration of the BMI process from technological assessment to concept development was over 18 months and consisted of a series of six single workshops. These were technological assessment (1 Day), market alternatives (1 Day), framing (1 Day), idea generation (1 Day), BM alternatives (1 Day) and concept development (1 Day). After the business model concept was approved by top management, the technology development process continued by advancing a step in the technology stage-gate process.

For the responsible project managers, the introduction and application of structured BMI processes had positive outcomes on project performance. While it is not yet possible to judge the final market success of the six innovations, several smaller improvements along the way can be attributed to the chosen approach. In Case 6, for instance, the time needed to transfer the innovation project from central R&D to a business unit project could be reduced considerably compared to prior projects. Time reductions could also be realized in Cases 3 and 4, as iteration cycles between technology development and BMI were shortened through the parallel development approach. The BMI processes developed a positive influence on the specific strategies developed in the projects. For example, in Case 6, the business model view in the early phase unfolded new opportunities and threats and led to an alteration in intellectual property strategy and R&D investments.

**“Great uncertainty prevailed about how the technologies could be marketed and which market to tackle. Because of a scarcity of market information, many decisions in these processes were taken based on well-founded assumptions and scenarios.”**

Table I summarizes the six cases and their characteristics.

## 5. There is not “the one” BMI process – key learnings

By identifying three distinct types of the BMI process and their characteristics, we provide a new lens to investigate the questions raised in the beginning of this article, namely, when a BMI process should be initiated, how the process relates to established technology innovation processes in the enterprise and who in the enterprise should be responsible to drive BMI.

### 5.1 The “When”: triggers of business model innovation

Our findings suggest that two different catalysts for BMI efforts exist in a corporate context: market pressure and technology push.

Cases 1 and 2 began when the involved business units were becoming dissatisfied with the current market situation and resulting financial performance. The BMI process was initiated as a reaction to these difficulties to capture value. Cases 3-6, in contrast, present a proactive setting, where BASF sought to create or alter markets out of a technology push situation. Our findings show that the relationship between technology and BMI can differ: in Cases 3 and 4, the BMI process was triggered at a very late stage of technology/product development; Cases 5 and 6, which are connected to a more disruptive technology innovation, involved BMI very early.

This duality, or even trinity, of triggers behind BMI have significant consequences for an established enterprise. It must be capable of initiating appropriate BMI activities based on triggers originating both from the external market environment and its own internal R&D activities.

### 5.2 The “How”: alignment between business model and technology innovation

Not only does technology innovation play a key role as a trigger for BMI but also its presence also influences the shape of the process. Two variables determine the process type:

1. the existence of a dependency on technological innovation and, if so; and
2. the maturity of that technological innovation (Figure 5).

This is a key insight to better understand the relationship between both types of innovation.

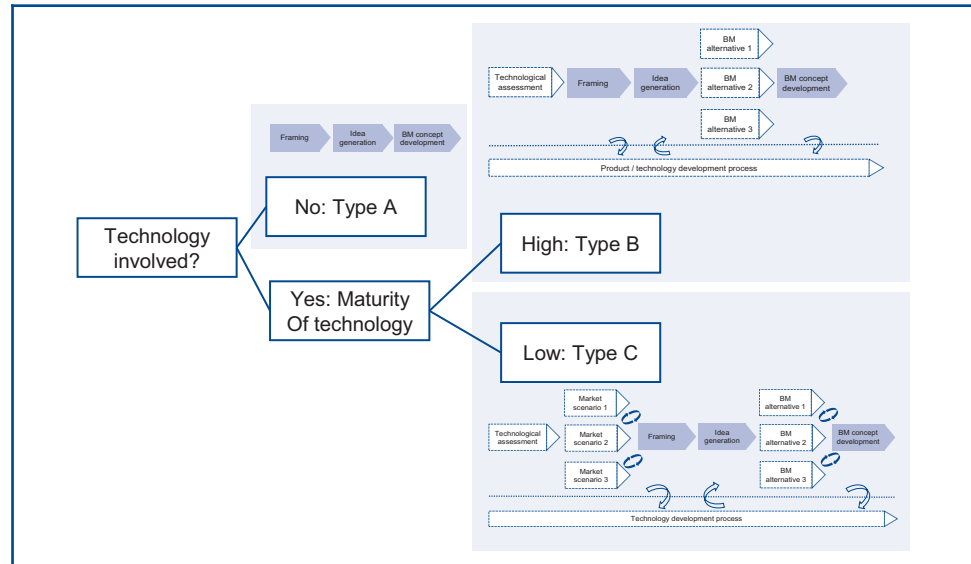
We were able to identify the existence of three BMI process types, each serving BASF in its own right. The BMI process can add value in isolation (Type A: back-end BMI), integrated with the development of a novel technology (Type C: fuzzy front-end BMI) or subsequent to the development of a new technology (Type B: front-end BMI). This finding implies that a large enterprise must be able to master the organizational complexity of all three types of process to fully profit from BMI. Alignment issues between technology and BMI activities are likely to surface here.

The findings also highlight technology uncertainty as a key factor in determining the nature of the BMI process. Type A is a linear process, which departs from an existing business with known market and customer structure and technology base. Type B takes longer and is more iterative than Type A. Its underlying technology or product innovation is still in development or was finalized only recently. While market knowledge is available, the exact value proposition may not be defined and the final technology still need to be completed. Lastly, process Type C is strongly characterized by the uncertainty prevailing in the fuzzy front-end of innovation processes. The only point of reference is a nascent technological innovation that has proven successful in the lab, but neither market knowledge nor legal or political conditions are determinable. Therefore, this process type is the longest, most integrated, and most iterative one of the three.

**Table I** Analysis summary of cases studied

<i>BMI process type</i>	A: Back-end BMI		B: Front-end BMI		C: Fuzzy front-end BMI	
Case	1	2	3	4	5	6
<i>Trigger</i>	Improve BASF's market positioning and capture more value from existing businesses by integrating formerly separated VPs	Improve BASF's market positioning and capture more value from existing businesses by integrating formerly separated VPs	Capture more value than with the current industry logic	Capture more value than with the current industry logic	Achieve market entry, capture more value in the future than with the current industry logic, secure strategic protection	Achieve market entry, capture more value in the future than with the current industry logic, secure strategic protection
<i>BMI component affected</i>	Product and service logic	Marketing and sales logic, profit formula, positioning	Product and service logic, profit formula	Value creation logic, product and service logic, profit formula, and positioning	Value creation logic, product and service logic, profit formula, and positioning	Value creation logic, product and service logic, profit formula, and positioning
<i>Locus of BMI application</i>	Business unit	Business unit	New business development in BU	Internal Venture	New business development in BU	Technology Incubator
<i>Team composition</i>	Market-based team	Market-based team	Mixed team (business-based)	Mixed team (R&D-based)	Mixed team (R&D-based)	Mixed team (R&D-based)
<i>Hand-over and implementation</i>	Implementation in BU	Implementation in BU	Implementation in BU	Market launch with Internal Venture Business case	Next gate in stage-gate BM concept	Next gate in stage-gate BM concept
<i>Status of technology</i>	Business plan Existing	Business plan Existing	Business case New development (finished)	In development (late)	In development (early)	In development (early)
<i>Time horizon of innovation project</i>	<1 year	<1-2 years	<1-2 years	<5 years	5-10 years	5-10 years
<i>Duration of BMI process</i>	3 months	6 months	6 months	12 months	>18 months	>18 months
<i>Degree of uncertainty</i>	Low	Low	Medium	High	Very high	Very high

**Figure 5** Technology dependence of business model innovation process types



### 5.3 The “Who”: organizational implementation of the business model innovation process

As outlined earlier, BMI research has not devoted much attention to the organizational implementation of BMI, mostly characterizing it as a CEO task and diagnosing a “leadership gap” at best (Chesbrough, 2007). We show that managing the corporate BMI process is a cross-functional and complex task. From the limited standpoint of a single case company, our findings illustrate one potential way of anchoring BMI organizationally. In BASF’s setup, a dedicated ISU at the corporate level serves as the central entity, ensuring coordination between market and R&D sides, different business units and other important stakeholders. Founded as a strategic initiative in 2005 to increase customer orientation across all units, *perspectives* support market units in developing novel and compelling business models for customers. The *perspectives* unit concentrates the required BMI knowhow and maintains a strong internal network with market and sales representatives, which helps assign the right people to the BMI projects it coaches. Bringing together expertise from different corners of the organization is a task of its own which requires dedicated boundary-spanners. Lastly, the head of *perspectives* directly reports to a member of the executive board, which ensures top management attention and support.

The BMI projects studied were headed by project leaders who reported to middle management, business unit heads and, in some cases, to the division head as the ultimate authority. BASF’s top management (executive board members) was not involved in the processes. These results are contradictory to but from our point of view more realistic than, prior results which saw BMI as the task of the CEO. Given the workload of top executives, a dedicated and well-networked unit specializing in BMI that has the mandate to operate across the group may be a good option to secure a continuous BMI processes in large enterprises.

## 6. Implications for management practice

Within the ideal setting of a large and diversified enterprise from the chemical industry, we were able to generate first-hand insights on the establishment, management and application of a corporate BMI process. The findings have significant implications for the management of BMI in the corporate environment.

**“Our findings suggest that two different catalysts for BMI efforts exist in a corporate context: market pressure and technology push.”**

*First*, there is not just one BMI process. Rather, built around basic core elements, there are at least three BMI process types, depending on whether technology development is involved and how mature the involved technology is. A global and diversified enterprise needs to master all three processes to build up a business model portfolio and to profit from BMI. While back-end BMI processes are valuable “emergency tool kits” to revive non-favorable businesses, front-end and fuzzy front-end BMI processes are strategic development tool kits to better focus and align general innovation activities and make them more effective.

*Second*, we described how BMI processes were successfully implemented in the corporate environment. Organizations engaging in BMI activities should consider these aspects when entering this field:

- *BMI processes are like recruiting, procurement or new product development processes* and therefore need to be structured and embedded in an organization’s existing process landscape.
- *BMI processes need corporate anchoring*, for which an ISU is an adequate option. The unit can tailor the process to specifics of the respective industry. As soon as the BMI process is defined, the ISU serves as the process and knowledge owner that spreads this expertise within the organization.
- *Since BMI requires the integration of specific market and technology knowledge*, the ISU needs to maintain a broad network within the company and its surroundings to identify and connect key knowledge and capabilities. As a consequence, apart from owning and coaching the process, the ISU should have the explicit task to serve as a boundary-spanner between market and technology know-how.

*Third*, we highlighted the value-adding potential of integrated BMI processes in the fuzzy front-end of technological innovation. Many times, R&D labs focus on the technology alone, which causes important aspects such as marketing, protection (i.e. monetization) or sales consideration to be ignored. Thus, there is great potential for improving innovation practices by incorporating the business model perspective at a very early stage. The most central implications consider the following aspects:

- *Install fuzzy front-end BMI processes as a part of radical technology innovation processes*: Technological breakthroughs offer vast potential for new value creation and value capturing mechanisms. Therefore, an organization needs to evaluate new business model opportunities very early, i.e. in the fuzzy front-end.
- *Enable and enforce early strategic debates*: Executives should utilize fuzzy front-end BMI processes to spur strategic dialog about which technologies an organization intends to develop into a future core business and which ones it will externalize. This early dialog supports effective resource allocation and shortens time to market.
- *Make use of the fuzzy front-end BMI process as a change management tool*: In successful, established enterprises with a long tradition, management tends to favor conservative solutions that proved successful in the past (Chesbrough, 2010).

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By building market scenarios and business model alternatives with different degrees of novelty, one can sensitize top management to new business model opportunities and therefore support a long-term mindset change.

In the current economic environment, companies need to create and maintain an entire portfolio of different business models for different markets (Sabatier *et al.*, 2010; Winterhalter *et al.*, 2016). While good BMI processes do not guarantee market success of novel business models, a systematic and structured way of developing consistent business models surely increases the likelihood of success. BASF's approach to BMI may serve as an example and inspiration to executives in other large and diversified enterprises.

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