Iztok Seljak, IEDC Bled School of Management

IN SEARCH OF EMBEDDED BUSINESS MODEL INNOVATION (1): PAVING THE WAY TO CONTINUOUS BUSINESS MODEL INNOVATION

Bled, March, 2015

ABSTRACT

Throughout history, from developments in society to the modern history of companies and corporations, the space of innovation has prioritised technical-technological innovation (TTI). The focus of this research and related four articles is different. It focuses on business model innovation (BMI). Through a quantitative survey approach to BMI in the European automotive industry, the research joins scholarly and practitioner conversations that are recently increasingly recognising, exploring and coming to more robust insights into the value derived from attending to innovation on the models upon which businesses (and wider society) operate, rather than the innovation of the products and services they offer. With conceptual and theoretical underpinnings from the resource-based view of the firm, BMI is here explored from the lense of dynamic capabilities and descriptive theories that have supported the development of capability maturity models. The results of this research speak to the value derived through BMI in conjunction with TTI as well as the value of BMI irrespective of TTI.

The traditional innovation gaze has been centred on the related structures, systems and processes for assuring a continual flow of TTI (those which have been held up as catalysts for major changes in society and organizations and consequently the sources of changing business models). This study, focused on BMI and its related BMI enabling capabilities and processes, investigates and describes how BMI exists not only to support, enable, realize and enrich, i.e. to "follow" and "escort" TTI, but is itself a set of resources and capabilities for generating new value. Moreover, BMI does not only play a supporting role but also leads, playing a solo role in efficiently integrating and upgrading existing and encouraging new TTI.

While research into BMI has been recently intensively growing, there is still a dearth of empirical studies, particularly those taking a systemic look at organizational capabilities for BMI – what we referr to here as embedded business model innovation (EBMI). As such, the research presented provides, while theoretically driven, significant empirically grounded results that shed light on how companies approach BMI and the capabilities and processes they build to continuously do them.

The primary data for this study came from a quantitative survey approach involving high level informants from 145 companies in the European automotive industry. The study is centered on dynamic BMI capabilities in companies in the European automotive industry, exploring their relation to TTI capabilities. Furthermore, it develops a set of tools enabling companies to progress quickly towards systematic continual BMI and finally openly challenges the dominant wisdom focused on TTI. The data provides insights into how BMI, in comparison with TTI, may deliver better results both from revenue, market shares and financial viewpoints. The research provides a window into the current distribution of BMI capabilities in companies in European automotive industry and investigates the roles of strategy alongside organization, human resource structure, reward systems and processes. Ultimately the presence, maturity and relative alignment of such capabilities in companies in the European automotive industry is found to be core to the level of a company's BMI performance. In total, the findings focus on the relative "embeddedness" of BMI within companies and how this relates to company growth and performance over time.

To clearly structure, articulate and present these findings, a business model innovation/technical-technological innovation capability matrix (BMI/TTI Capability Matrix) is developed and the relations

between the two are explained. Complimentary to the matrix is a five-level model of the relative maturity (embeddedness) of BMI capabilities within a company. This five-level maturity framework (EBMI Capability Framework) of embedded BMI capabilities and processes (pre-phase, start-up, strategic commitment, pre-integration, integration) provides fresh insights, both theoretically and practically, in the space of innovating through business models.

The BMI/TTI Capability Matrix and EBMI Capability Framework integrate theoretical insights around BMI, dynamic capabilities and descriptive theories supporting the development of capability maturity models, bringing into relief empirically studied relations between BMI and TTI. They each separately and both together represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, embedded, systematic, continuous BMI and an important tool for practitioners to adapt their companies to the ever faster changing environments and to proactively provoke productive changes within them. Moreover, the results challenge the dominant logic that the combination and cross-link/cross-integration of TTI and BMI is the best option for achieving superior company growth and performance. The results actually indicate that a focus solely on innovating business models may yield the highest enhancement of growth and performance.

Our four related articles will step by step reveal these exciting and at least partially even provoking new dimensions of BMI. We are starting the BMI journey by addressing the most relevant theoretical basics to set the scene for surprising new insights in the current and future BMI landscape.

1. RECOGNISING THE VALUE OF BMI

1.1. We need continuous BMI!

Faced with complex and ever more demanding challenges, businesses – and societies and economies more generally – need to increasingly attend to innovation. Throughout history, from developments in society to the modern history of companies and corporations, the space of innovation has prioritised technical-technological innovation (TTI). The focus of this research is different. It focuses on business model innovation (BMI). Increasingly, scholars and practitioners are recognising, exploring and coming to more robust insights into the value derived from attending to innovation on the models upon which businesses operate, in addition to (as well as rather than) the innovation of the products and services they offer. In that respect, in searching for new relevant responses, BMI as a concept has arisen as one of the main potentials of future innovation and new value creation, as one of the most important future dynamic capabilities of firms (Johnson, 2010, Johnson et al, 2010). It is this conversation that the present research joins.

In the serial of four articles, altogether dedicated to embedding BMI into the companies' DNA, this first one is addressing the relevant theoretical backgrounds, leeding us to capabilities and processes for assuring continouos BMI. We are herewith seting the scene by linking relevant theoretical backgrounds from BMI theory with the related experiences and views of many other companies and executives. We describe the case of Hidria, as one of the several companies having already done many steps towards assuring continual BMI, but finding itself stuck at a certain well advanced point of the journey, looking for further directions. BMI capabilities and processes are being identified by introducing the basics of BMI related theories, resource-based view and dynamic capabilities theory and theories supporting the development of capability maturity models, alltogether providing theoretical foundations for embedding BMI.

It is our goal to fully release BMI and related capabilities as an important source of competitive advantages. While promising a lot, on the other hand, as Weill *et al*. (2005, p2) have clearly put it, the potential of BMI has so far actually been largely underdeveloped:

> *"Few concepts in business today are as widely discussed and as seldom systematically researched as the concept of business models….. We do not even know, for instance, how*

common the different kinds of business models are in the economy and whether some business models have better financial performance than others."

As Weill *et al.* (2005) highlight, there is much we need to understand regarding organizations and their capabilities to innovate not just from a technical-technological point of view, but from a business model point of view. There is much ground to cover, particularly regarding companies that display high capabilities in BMI, those that excel at continuously dynamically changing the very way they function through adapting to ever increasing speed of external changes and through provoking and creating these changes themselves.

In order for innovative business models to be able to really play that envisaged role successfully, significantly more empirical research on BMI as a specific type of dynamic capabilities is needed. In particular, we need to investigate not only the occasional inspiration of individuals and teams – the sporadic and random BMI which are often reactions to threats – but a systematic consideration of how these can become systemic, proactive and react to the opportunities, and thus become continuous (Chesbrough, 2010a, Mitchell and Coles, 2003, Sosna et al, 2010).Very much like today's systematic focus on TTI – which in the past also was primarily sporadic and seemingly random – this research takes a systematic focus on BMI as a dynamic capability emerging from particular processes and supporting capabilities.

Within the business landscape today, there are companies with presumably varying levels of focus and capabilities within BMI. This research has brought together 145 of those companies from the European automotive industry – a mature, moderately dynamic industry – to explore and learn from their approaches, capabilities and processes around BMI today. The core hypothesis of the thesis is that BMI capabilities in European automotive industry, their quality, quantity and intensity i.e. maturity, are crucial and decisive for achieving above average growth and above average overall performance of companies. Furthermore, it is assumed that companies which excel in this space have developed systematic BMI capabilities and processes and that these depend on the BMI related amount and quality of strategy, organization, human resource, reward system and processes and their maturity.

Theoretically the research combines the so far available work on BMI capabilities (Chesbrough 2010a, Johnson 2010, Johnson et al, 2010, Kamoun, 2008, Margreta, 2002, Mitchell and Coles, 2003, Sosna et al, 2010), the resource based view of the firm and the dynamic capability approach (Eisenhardt, 1997, Pisano, 1997, Teece et al, 1997) and the descriptive theories that have supported the development of capability maturity models (de Bruin et al, 2005, Fraser et al, 2002, Kaner and Karni, 2004, Paulk, 1993, SEI, 2000). The empirical data is a large quantitative study of the automotive industry in Europe involving 145 companies through a survey aimed at the top management of these companies.

At this point, and with full transparency, we would like to describe a unique role of one of the co-authors, Iztok Seljak, in this field. For the last twenty-six years Iztok has worked with and for Hidria, a globally active Slovenian company. Hidria is a world leader in diesel cold start systems and solutions for hybrid and electric vehicles in the automotive industry. Hidria is also a European leader in developing and implementing energy efficient sustainable professional climate, ventilation and heating systems with integrated renewable energy solutions for buildings. For the past seven years Iztok has served Hidria as CEO, guiding its TTI and also strategically leading BMI oriented efforts. As such, he comes to this research with a significant amount of practical, industry experience. This experience has provided richness in carrying out this study as he sees the issues not only from the objective empirical and theoretical side, but from an even more subtle and sophisticated insider perspective. He has combined his evolving practical knowledge from the field with his academic pursuits. While he is living this research field as a practicing executive every day, he has sought out and assured objectivity through the theoretical and methodological rigor of the study. Throughout he has sought to suspend his own assumptions and has constantly sought the objective advice of expert researchers in the field to

overview and critique our evolving research. At the end of the day, we believe we have thus produced a unique, highly relevant and objective new view on BMI. Through this, we stand by the outcomes of the BMI/TTI Capability Matrix and EBMI Capability Framework as relevant and robust tools for researchers, theorists and practitioners alike.

Before moving into thetheoretical backgrounds of the study, we briefly outline the Hidria story as indicative of companies out there that do BMI and of the shortcomings of their capabilities and processes in order to further illustrate the background of my thinking around the topic.

1.2. Innovation obsession meeting BMI attractivness

Hidria started in the small Slovenian town of Spodnja Idrija as Hidria Rotomatika in 1971. As a company within the former Iskra Group, it was a producer of small electric motors for household appliances. Hidria grew during the 1970s by developing larger electric motors for refrigerator compressors. The 1980s were characterized by an upward vertical integration in rotors and lamination as components for electrical motors, becoming in the early 1990s a new core business of the group. The second part of the 1990s was marked by an intense diversification and inorganic growth through acquisitions of a power tool company, a diesel cold-start systems company and a professional air-conditioning, ventilation and heating solutions providing company.

In the last ten years, Hidria has again been concentrating on two core businesses, automotive and climate technologies, by divesting or closing non-core businesses. Hidria's mission became to provide innovative break-through solutions for assuring sustainable green mobility and for assuring sustainable in-door wellbeing. Based on the consequent successful implementation of that vision since 2004, Hidria is today one of the global leaders in diesel cold-start systems and lamination for electric powertrains for hybrid and electrical vehicles as well as one of the European leaders in professional air conditioning, ventilation and heating systems with integrated renewable energy sources and energy management systems for buildings. Corresponding to the company's strategic directions several institutes, technological centers as well as international production facilities have been established. The company has also grown organically and through acquisitions in, among other countries, Germany, Hungary and China.

The company has been recognized many times for its innovation, with innovation being embrassed as one of the core company values and competitive advantages. It was named one of the four most innovative companies in Slovenia in 2009 by AT Kearney, as a Hidden Champion of South-Eastern Europe by IEDC Bled (based on Simon Hermann's related methodology) and as Europe's most innovative company for 2012/13 by the European Business Awards (EBA). This recognition was both for TTI and BMI.

In 2006 the top management team of Hidria (led by Iztok Seljak, responsible for innovation since 2004 and as CEO since 2008) began to broaden the scope of innovation to include BMI, which were becoming an important part of the company's strategy. As the company deepened its familiarity with and understanding of the phenomena of BMI we expanded our efforts from TTI to examine possibilities for innovation across the value added chain. In these processes we have considered all aspects of the value chain, including those not under our direct control, in the search for collateral competitive advantages for Hidria and our partners.

The term "business model innovation" started to be used in our talk from the top and applied to different kinds of new innovative approaches that did not just fit into the TTI field. It started to get the wider notion of "how are we going to (continually) change the way we do things around here". Every individual and team was encouraged to, as a part of their regular responsibility, constantly rethink and reshape/innovate their own fields of work.

In late 2008 our top management expanded our TTI focused awards (for new products, technologies and internal processes) to include BMI. This move encouraged more Hidria leading employees from

top to middle management, to enter the BMI thinking space. Based on that decision we started to obtain a more considerable number of relevant suggestions of BMI, of which I shall highlight three.

A team developing a mild-hybrid stop-start system – auxiliary electric power-train platform for a premium motorcycle producer, moved from "only" developing the innovative technological solution for the original equipment manufacturer (OEM) to upgrading this offering by engaging with a partner PR agency to develop a complete innovative PR campaign for that solution towards the final customer, as if we were that OEM ourselves addressing the end-user. This approach included top state-of-the-art brochures addressing final customers in such a convincing way that it also convinced the OEM itself to proceed with the project. This addition, this step further, this extra mile from "just" TTI to an innovative approach also in the related sales and marketing field, showed to them from an additional perspective that the new technical solution in terms of its practical value for the final consumer really made a lot of sense. Having missed such an additional, i.e. wider approach and view of the issue, such a decision by the customer/OEM would not have been taken. It ended up with moving quickly into prototype phase along with substantial coverage of R&D costs by the customer.

The second example comes from software design. Within Hidria's climate technologies division a new software model was developed to manage all core variables influencing the optimal design of solar power plants. This design enabled our teams in renewable solar energy to provide to the customers not just solar panels, but complete turn-key solutions for solar power plants, including a binding economic proposal i.e. a basic feasibility study, on the spot, from the first discussion with a customer. This positively and significantly impacted our time and speed to market. With the time to market, linked with different kinds of coming and going subventions being one of the core key success factors, it consequently increased the speed of our positioning towards competitors.

Finally, and in a broader spectrum, Hidria led a new initiative in the construction world with the creation of a consortium of companies across southeastern Europe (SEE). Named Feniks, it is a group of 45 formerly competitor companies, representing 35,000 employees and collective revenue of more than 5 billion EUR annually. These small and medium enterprises within the SEE construction industry were for some time fighting each other, losing value in an increasingly shrinking market. Seeing this unproductive positioning, Hidria championed the Feniks initiative, seeking to unite the competences and capabilities of these companies, and creating a critical mass to address large turn-key projects outside of the SEE region. Today Feniks is addressing projects in Russia, Ukraine, Belarus, Kazakhstan, Azerbaijan and the markets in the Middle East and North Africa (MENA). Within this consortium Hidria provides and integrates its proprietary in-door wellbeing solutions. It represents a successful move from competition to co-opetition based business model.

1.3. Continous BMI as a precious competitive advantage

Within Hidria, by 2010/2011 results from BMI, together with – and also besides – TTI started to clearly provide an important value added for our customers, strengthen our advantages over competitors and thus also considerably contribute to the company's performance.[1] At that point, we decided to implement BMI as a part of our business development planning process. This was an addition of BMI to the existing TTI focus of Hidria's annual planning process which takes into account both ten-year strategic views and three-year operative views. By doing so we wanted to assure that BMI would become a systematic preoccupation of the management of each of our strategic business units, i.e. of their core businesses, including all employees and that BMI would represent additional support for the launch and success of our new products, processes and technologies.

While Hidria is currently further increasing the pace and dynamics of BMI it is but still not achieving a continuous stream of valuable bottom up BMI as we do with TTI. Within Hidria there is a continuous stream of TTI coming from across the business – often issued by employees and middle

[1] in that period, Hidria was profitably growing with an aggregated yearly growth rate of over 15 % and has been quickly expanding its market share

management. By contrast, BMI predominantly still comes from the top, and are more sporadic, random than continual. BMI is not up to the par, nor is it fully integrated with TTI.

Despite valuable developments within BMI, it is just not yet "working" with the same effectiveness as TTI processes in the company. This led us to question more about the BMI processes and relevant related BMI capabilities and influencing factors that would improve a company's ability to innovate through business models. This led us to the related core research questions driving this research project - which are the core dynamic capabilities in the companies that are enabling continual innovations of business models in companies in moderately dynamic industries? Which factors do they depend on? How developed are the capabilities for innovating business models today and how do they develop in time?

Taking this brief overview of the Hidria context as an example, we can see both the potential for BMI and the lack of realizing that potential. In the space of strategic innovation, companies focus on accumulating talent, expend effort in understanding the wide factors that may shape the future of industries (e.g. scenario planning), and continuously refine and align their vision, mission and strategy. Yet, as in Hidria, this is consequently in the application part mostly focused upon road maps of TTI and the development and rollout of execution plans for new technical solutions and innovation – products, technologies, processes, materials…. Even with an effort such as that introduced by Hidria, we still seem to fall short in realizing the potential of BMI, at least as a continuous process of innovation such as we see developed and applied to technical-technological development.

A more subtle look at this suggests that we may even be placing the emphasis in the wrong place by focusing first and many times only on TTI. According to Jansen *et al.* (2007), a real breakthrough in technology creates the needs for new organizational structures and for new strategies to exploit the technological innovation and realize new competitive advantage. New properly founded business models are necessary in order to employ such a new technology effectively. Additionally though, also without any new TTI, a new BMI itself can better leverage a company's existing product/service portfolio. Innovation in business models has the potential not only to support but to outpace several TTI themselves. On one side, they could prevent certain TTI from coming to market or gaining market recognition, on the other they could support and more efficiently implement TTI, or a new business model could encourage and bring forth new TTI. Put another way, theoretically speaking, BMI can both enhance performance in the absence of TTI and also support or encourage new TTI in more effective ways.

It implies that in each of the mentioned cases, more advanced and mature BMI capabilities are supposed to correlate with better financial performance of the companies, i.e. better developed BMI capabilities are supposed to be one of the important attributes of better companies' financial performance, also positively correlated with the positions of leaders and co-leaders in the industry.

This so far theoretical claim by itself raises the question of whether our current focus on TTI over BMI is, as the English saying goes, putting the cart before the horse and how we should change that. Interested in verifying the relation between BMI and TTI deeper and understanding their interrelations in terms of their effect on performance of the companies, we are converting the expectation that the combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities will result in the best company's performance in terms of sales growth, growth of market shares and growth of profitability into one of the hypothesis that will be tested in the research.

As was the case in the earlier years of innovation research, the core issue and related challenges lie in exploring and developing means of systematically doing BMI, just as we have explored and developed, and continue to explore and develop, means of systematically doing TTI. As of today BMI still seems to be the purview of different levels of executives. Moreover, they remain random, reactive rather than proactive, and are generally non-systematic.There is nevertheless a general finding arising that business models and their differentiation can be, and will increasingly be the source of competitive advantage in the future. For example, Johnson (2010) argues that successful companies

already view BMI in much the same way they view product innovation, that is, they view them as something of an experimental capability. They are pursued through a portfolio of small-scale experiments that can greatly expand their strategic options in response both to homegrown opportunities and to potential disruptors of market shifts. However, to come to such a point, to develop such kind of capability, BMI needs to become a systematic, manageable process rather than one reliant (as it so often was in the past) on luck, serendipity, and inspiration. A regular process from idea generation through to execution of BMI is needed. Consequently, much of the latest literature from the field of BMI is increasingly discussing the need for developing such processes, capabilities and structures, while not yet specifically addressing them and not yet providing any specific answers for dealing with them. For example, Mitchell and Coles (2003a) state that in their studies they still failed to locate companies that had turned business model development and innovation into formal, nonstop processes, like those used in larger companies for new product development and quality improvement. They predict that in the near future, continually improving BMI, however, will become an essential skill in all industries, otherwise a company will not be able to keep up.

Furthermore, companies that develop the ability to systematically do BMI, irrespective of and in combination with TTI, will create considerable and sustainable competitive advantages. As Mitchell and Coles (2003, pxi) state *"*the one thing that can most improve a company's growth and profitability is having the best process in your industry for continuing business model innovation.*"* Yet we lack an understanding of how – from a process and capability perspective.

Our research project therefor dives headlong into this gap, departing from the practical personal managerial need to transform business models, to focus on how BMI can become a regular, continuous and systematic process akin to TTI processes. The starting point of this exploration is, of course, literature. We began by exploring and studying the available and emerging scholarly work within and around the field of BMI. While this field is developing and expanding, the majority of related scholarly work still concentrates on innovating specific business models – for example, the explanation of the machinations of a new business model such as sponsor based business models proliferating the digital environment – but very rarely and to a very much limited extent on the required capabilities and processes for sustainably achieving BMI overall.

We are therefore basing our work, in addition to my own practical experience of the field, upon a set of BMI theories (Chesbrough 2010a, Johnson 2010, Johnson et al, 2010, Kamoun, 2008, Margreta, 2002, Mitchell and Coles, 2003, Sosna et al, 2010) in combination with the resource based view, dynamic capability theory and descriptive theories that have supported the development of capability maturity models (de Bruin et al, 2005, Eisenhardt, 1997, Fraser et al, 2002, Kaner and Karni, 2004, Paulk, 1993, Pisano, 1997, SEI, 2000, Teece et al, 1997) to develop an in-depth view to what we "know" and what we do not "know" about BMI capabilities and processes. Flowing from this, I developed a substantive questionnaire aimed at investigating how BMI gets done in companies. The sample of 145 companies from the European automotive industry represents an industry in flux, one traditionally focused upon TTI, but one that also has a varying degree of BMI already happening.

Within this field we have focused on how overall BMI really gets done, not on specific examples of BMI alone. The primary research is focused on the challenge of how to assure continual BMI in organizations and how to provide for capabilities and processes, required for achieving a continuous stream of BMI and their successful implementation. The research therefore addresses a step beyond BMI, investigating embedded business model innovation (EBMI) capabilities. The aim is to empirically investigate and theoretically understand these capabilities and processes with consequent practical implications.

As the leading researchers in the field note, there is a clear need to move from reactive, random BMI to well-oiled BMI processes – from current idea creation and implementation processes to the BMI factory (Chesbrough, 2010a, Johnson, 2010, Johnson et al, 2010, Mitchell and Coles, 2003, Sosna et al, 2010, Weill *et al*. 2005). The research is therefore centered on identifying and presenting BMI capabilities in companies, as a basis and pre-condition for successful BMI creation and

implementation. Across this research, and within my empirical field, I analyze the existing status of BMI capabilities and processes and develop both the aforementioned BMI/TTI Capability Matrix and EBMI Capability Framework.

From an academic perspective, this work contributes new insights and new knowledge in the field of BMI by defining the most relevant BMI capabilities. The implications for the practical business world are also eminent. These findings intend to, in addition to providing tools for improving BMI performance, strengthen companies' abilities and capabilities to boost competitive positions with existing products and markets, open completely new markets and re-shape whole industries. The results are intended to be an important contribution and contributor to the faster growth of companies and industries, to the growth of overall stakeholder value and to overall economic development.

2. MEETING BUSINESS MODEL INNOVATION ROAD DESIGNERS

2.1. These are our BMI architects …

BMI are being herewith widely understood as all non technical/technological innovations (i.e. non product, technology or material innovations) related to value creation in companies. Margreta (2002, p. 3) is describing business model innovations as *»…any change in the value added chain of the company, as the result of which the company gains a competitive advantage over rivals, adds value to the customers and consequently creates new value for itself"*. Similarly, Mitchell and Coles (2003, p. 3) are stating that *"A business model is the who, what, when, where, why, and how much a company uses to provide its goods and services and receives value for its efforts. By business model innovation we mean any succesfull change in any business model element that substantially enhances a company's ongoing performance vs the competiton in sales, profits and cash flow."*

Thus BMI can range from smaller incremental improvements within any part of the value added chain of the company, i.e. within any of the elements of the existing business model, as long as it is creating important new value added for the customers and for the company, to introduction of large disruptive substantially new business models.

Unlike using many other definitions of busines models, a business model is herewith for the purpose of addressing the future of BMI in companies and in accordance with dynamic capabilities theory understood as a specific bundle of company's resources and capabilities, defining a specific way of delivering new value added to their customers and creating their own results. It is defined as an important dynamic capability of companies, that already is and will further be an even more important element of company's competitive advantages.

Within the BMI, an important part of the literature is increasingly stating the need for fully integrated BMI - while not yet specifically and extensively elaborating on how they would look like (Chesbrough 2010a, Johnson 2010, Johnson et al 2010, Kamoun, 2008, Mitchel and Coles 2003, Sosna et all 2010).

Mitchell and Coles (2003) are stating that the one thing that can most improve a company's growth and profitability is having the best process in your industry for continuing BMI and are urging companies towards establishing such a process for continuing BMI. They claim that new business models usually emerge from a deliberate process of innovation and that unless having such a process companies are underscoring on utilisation of opportunities for desirable new business models. Such processes should insure looking at product and technical innovation, services and technologies with a single minded focus on new business model to stop missing the best opportunities.

Sosna et al (2010, p. 384) also believe that *"…continuous business model innovation is an important capability for every firm seeking success in the long term."*

Chesbrough (2010a) drives a parallel between well organized processes for technical/technological innovation and their absence in business model innovation to state the need for developing capabilities and processes to innovate business models. He claims that while companies are extensively investing

in exploring new technologies, they can only market them through their business models. But they have very little or none of the abilities to innovate the required business models. As a matter of fact, the same technology taken to the market through different business models will have different economic outcomes. So companies should also have capabilities for innovating their business models.

Johnson (2010a) goes a step further by stating that the new process for BMI needs to be systematic and not random, just like in product and technology innovation. He suggests putting in place an experimental capability for BMI, pursued through a portfolio of small-scale experiments.

According to Johnson, in order for the companies to develop such kind of capabilities, BMI cannot remain dependent on luck and inspiration, but need to become the result of systematic, managable processes. He claims that the companies, possessing robust BMI capabilities will be able to focus on future opportunities (and threats, changing them in opportunities on time) without a burden from their existing systems and structures.

Besides a growing number of scholars, identifying the need for systematic BMI and for describing the way to come to a such supportive sustainable continuous BMI idea creation and execution process, in parallel the need is being similarly strongly expressed also on the side of practitioners, managers and leaders, confirming Hidria not being alone, stalled in the middle of the BMI road in construction.

In that respect, Faouzi (2008) signals that a vast majority of executives are expecting further changes to at least one aspect of their business model over the next 3 years. An important part of executives are citing the emergence of new technologies as an issue that would necessitate major revisions of their business models.

Simmilarly, according to Johnson et al (2010c), well over half of executives believe that BMI will become even more important for success than product or service innovation. Johnson (2010b) also highlights that nearly all of the corporate CEOs report the need to adapt their business models. More than two-thirds say that extensive changes were required.

Johnson (2010a) specifically underlines that the new process for BMI needs to be systematic and not random.

Based on all of the mentioned findings, we can further clearly detect and extract some core characteristics of the future advanced BMI related capabilities of the companies versus the existing »infancy« level situation. The processes for BMI should be, alike the processes for product and technology innovation, planned in advance and linked with TTI. The in-depth and most productive and creative linkage of both TTI as well as BMI will be specifically powerful. These processes should be systematic to assure the continuous flow of new BMI. They need to address not only threats, but specifically also opportunities. They need to be integrally included in the overall business development plan of the company. They also need to include some core elements, and we shall extract them accordingly to study them empirically.

2.2. …..these will be their new design ingredients …

A notable number of scholars are implicitly or explicitly suggesting at least some elements, which the capabilities and processes for supporting continual BMI should contain. An increasing amount of the literature is thus starting to show the way i.e. is attempting to reveal some possible/required dimensions and elements of such an integrated BMI process and related capabilities Within this literature, implicitly or explicitly and rather fragmented, the need for defining required culture, vision and strategy, structures and processes, as well as dedicated human resources and rewarding systems, is being gradually developed (Chesbrough, 2006, Chesbrough, 2010, McGrath, 2010, Mitchell and Coles, 2010).

Envisioning the future sustainable integrated continual systematic BMI processes, Mitchell and Coles (2010) are focusing on soft values, primarily on required vision/meaning and associated values as well as inspirational and distributed leadership. They emphasise the need for creating a company's specific

and explicit BMI vision and related values, that support the best business models. Mitchell and Colles (2010) are providing the case of Nucor, an American innovative steel making company, following and executing such track. Mitchell and Colles (2010) claim that Nucor made many organizational innovation to its business model to encourage better performance.

These include flattening of the organization chart, the delegation of responsibility and authority, generously supported education, promotion from within, variable compensation and production bonus and incentives based on firm's profit performance. It all reflects the BMI vision of being a leader by commercializing new technology.

Chesbrough (2006) calls for more involvement of TTI responsible personnel also in BMI. He urges combining of TTI and corresponding BMI into a one systematic organized coordinated process, embracing the principles of open innovation. He also opens an issue of the responsibilities of the R&D/technical managers besides for theTTI also for BMI, as being an equally important task as developing process and product innovation is.

Chesbrough claims that due to the value chain, constructed around the offering, R&D managers must play an important role in the development and execution of the business model. They must regard "the architecture of the revenues" as a vital element of capturing value from technology. Technology managers need to include experiments in alternative business models.

He recently further upgrades his view on complex puzzle of human resource responsibility linked with BMI (Chesbrough, 2010) by asking who in the companies really is supposed and competent to be responsible for BMI. Functional managers lack cross-functional responsibilities, CEOs usually defend the existing business model, general managers of business units usually rotate the positions and have no time for formulating and executing new business models.

He thus widely opens the important question of BMI related personnel responsibility i.e. of the leader/s in charge of developing BMI, including the related need for strategic agility, which enables companies to transform their business models while pursuing strategic innovation. Persons and teams in charge should posses"leadership meta-skills", which include their broad perceptions of the environment, ability to maintain unity among the leadership team, and, importantly, the ability to reallocate resources to support new business models.

McGrath (2010) emphasizes that in addition there is also a considerable lack of incentives which are to support larger focus of leaders and employees on BMI processes. She calls for a determined champion to lead the process, with viability to question the business model and capability of having conversation with those who might challenge it.

Besides fragments of these or similar elements contained in a different proportion in different BMI and wider literature we can also trace their "ensemble", like most remarkably in Galbraith (1995), introducing his "star model" of an overall organizational design framework and Markides (2005).

Galbright highligts five categories. The first is strategy, the second is structure, the third are the processes, determining the flow of information. The fourth are reward systems, and the fifth are people (human resource) policies.

Markides describes organizational environment, meaning four things: the culture of the company (its norms, values and unquestioned assumptions), its structure (its formal hierarchy, its physical setup as well as its systems (information, recruitment, market research and the like); the incentives (monetary and non-monetary ones); and finally, the people (their sklills, mind-sets and attitudes).

Consequently, we are building the embedded BMI capabilities processes around BMI related vision, asociated culture and values, organizational structure (its formal hierarchy), people i.e. human resource and around related incentives i.e. reward systems.

2.3 …and this is the available space to build in.

The literature is actually increasingly stating the absence of such an integrated BMI system in practice and emphasising related problems with empirical evidence, calling for empirical research. This highligts the important fact that we so far do not dispose with any systematic empirical evidence of existence of such a framework (Chesbrough 2006, Johnson et al 2010, Mitchel and Coles 2006).

Inspite of quoting on Nucor case, Mitchell and Coles (2010) are just recently emphasizing that they have still failed to locate companies that have really managed to turn business model development and innovation into formal, nonstop processes. Thus, BMI are still mostly driven by near-term problems. Just some companies, that are excelling at BMI, are starting to respond to opportunities instead of only to threats. They claim that we find ourselves at the dawn of the era of continual BMI as a precondition for companies to be able to sustain the competitive game.

After Johnson (2010) mentions a great need of managers to change business models, he continues that but "*Yet despite all the talk, few seem to know how to pull it off. No more than 10 % of innovation investments at global companies are currently focused on developing new business models (The Quest for Innovation: A Global Study of Innovation), which is underlyning a huge gap between wishful thinking and reality«.*

Johnson makes this gap further more explicit (Johnson, 2010) by stating some reasons for not being yet able to start building such system. Very few people really understand what a business model is (and what it isn't) in the first place or what model their organization is actually operating under. And much less know how they would go about creating a new one and why or when they should.

Chesbrough (2006) nevertheless would feel that there are companies, at least relatively excelling in BMI. He is convinced that companies' business models will shape the world in which they compete in 21st century and that there are companies today creating open business models that will help them innovate through a global marketplace of ideas, both as suppliers and as customers.

In summary, in spite of presumably having numerous first class examples of companies that excel at continuously and dynamically changing the very way they function through adapting to an ever increasing speed of external changes, the processes enabling such a positive dynamics, have so far not been properly studied and explained.

Therefor, it is worth looking into them closer. In aiming at doing so, BMI scholars so far seem to be stalled within the boundaries of BMI theories, ignoring important highly relevant boundary theories, offering lots of potentials for resolving this issue. The scholars are also not making any clear difference between different types of required systematic BMI processes, depending on the industry and its dynamism/velocity. We will answer these questions and resolve these issues in order to gain somewhat clearer view into the future with the precious support of dynamic capabilities theory and theories supporting the development of capability maturity model framework, which both will provide us the required basis to check upon an »embedded business model innovation« process as a specific dynamic capability of the companies in moderately growing industries. Thus we shall gain new signs and directions for moving forward on our BMI road in contruction.

3. FIRST PART OF THE ALREADY CONSTRUCTED ROAD – EASY TO ADVANCE ?

3.1. Looking for underlying capabilities and processes

By applying resource-based view and dynamic capabilities theory, capabilities and processes enabling and creating BMI will be defined and analyzed as a specific type of dynamic capability. In order to reach this goal, the work of Eisenhardt, Pisano, Teece et al (1997) and other scholars in the field of dynamic capabilities theory is taken in consideration. To understand, how these capabilities and routines develop and what they depend on, the capability maturity model theory is applied. It includes the contributions of Carnegie Mellon i.e. their SEI (Sofware Engineering Institute), De Bruin, Fraser et al, Kaner and Karni, Paulk and others.

So far, we have made the argument that processes, supporting innovation of business models as a special kind of capability of companies and assuring a continual flow of BMI ideas and of their execution, are of an increasing importance, since they lead to creation of important new value added in companies. Since so far these capabilities and processes have not yet been properly researched and described, little is known about who they are, how do they look like, how in particular they work and how they can enhance our abilities for BMI.

Our primary target is thus to reveal these capabilities and processes and to find out how do they develop and what they depend on.

3.2. Treating BMI as a special kind of dynamic capabilities

Looking for best practices in BMI, we shall lean ourselves on the framework of dynamic capabilities, by defining BMI capabilities as specific dynamic capabilities of the companies. Eisenhardt (1997) points out that specific dynamic capabilities exhibit common features that are associated with effective processes across firms. She calls them »best practice.« Dynamic capabilities are a part of the wider resource based view theories.

According to Eisenhardt (1997, p. 1105) the resource-based view is *»…an influential theoretical framework for understanding how competitive advantage within firms is achieved and how that advantage might be sustained over time….it assumes that firms can be conceptualized as bundles of resources, which are heterogeneously distributed across firms, and that resource differences persist over time… when firms have resources that are valuable, rare, inimitable, and nonsubstitutable, they can achieve sustainabale competitive advantage by implementing fresh value-creating strategies that cannot be easily duplicated by competing firms. …When these resources and their related activity systems have complementarities, their potential to create sustained competitive advantages is enhanced.«*

Therefor, we will treat BMI capabilities and their underliying processes with all of their characteristics as a special kind of dynamic capabilities. They will be thus looked at from the resource-based view perspective and will be defined according to Teece et al (1997) dynamic capabilities definition as *»…. the firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change, as the organizational and strategic routines by which firms achieve new resources configurations as markets emerge, collide, split, evolve, and die.«*

Eisenhardt (1997) in addition shows that the pattern of effective dynamic capabilities *»depends upon market dynamism«* and introduces the dynamism of the markets as one of the core independent variables effecting dynamic capabilities. In moderately dynamic markets, dynamic capabilities rely heavily on existing knowledge and are more effective when they involve a structured and analytical process. They are complicated, predictable processes and evolve slowly over time. In contrast, in high velocity markets, dynamic capabilities rely much less on existing knowledge and much more on rapidly creating situation-specific new knowledge. They are simple, experiential and iterative processes. Complicated, highly adaptive moves required by high-velocity markets are driven by simple rules.

Since the processes, assuring continual flow of BMI in moderately growing industries are a special type of dynamic capabilities, *»complicated, predictable processes, which evolve slowly over time«* and since these specific routines as the comonalities in processes have not yet been researched and explicitely explained for BMI as a specific dynamic capability in moderately dynamic industries, we will be looking at them closer from this perspective.

We shall also be specifically looking at the best developed i.e. best functioning processes, assuming that they are besides structured analytical processes in some combination also using the high-velocity industries alike experiental and iterative processes and can thus insure both incremental as well as radical innovations of business models. Such a »hybrid« would be an important counterweight to otherwise envisaged »false trade-offs«.

Balasubramanian et all (1999) are actually defining the capability as *».. a distinctive atribute of a business unit that creates value for its customers. Capabilities are measured by the value they generate for the organization.Thus capabilities differentiate an organization from others and directly affect its performance.«* And, according to Balasubramanian et all (1999) capability achievements in process execution and their impovements are expressed by a capability model.

3.3. Using the support of theories describing capability maturity models (CMM)

At this point, we are interested in a comprehensive overview of descriptive theories that have supported the development of capability maturity models as well as of their development towards its use for business processes in order to capture its potential value added for understanding and facilitating BMI capabilities development.

Our aim is not only to detect BMI capabilities in companies, to detect the related commonalities/routines and their development and dependence on different factors. Our aim is to enable companies to move from the situation »as is« to the »to be« situation, that is to also prescribe, and to compare, to benchmark the capabilities not only to competitors, but also wider. Therefor we will use the capability maturity model as a very practical theoretical framework, addressing all of these issues sistematically, as the tool and as a wider theoretical framework for researching the embedded BMI process.

According to Paulk et all (1993) maturity as a measure to evaluate the capabilities of an organisation in regards to a certain discipline has become popular since the Capability Maturity Model (CMM) has been proposed by the Software Engineering Institute at Carnegie Mellon University. This model was orginally developed to asses the maturity of software development processes and is based on the concept of immature and mature software organisations. Paulk et all (1993) stress that improved maturity *results »in an increase in the proces capability of the organisation.«* Capability maturity model introduced the concept of five maturity levels defined by cumulative requirements.

SEI (2000) and Web defines the capability maturity model as

»…a formal archetype of the levels through which an organization evolves as it defines, implements, measures, controls and improves its processes in a particular area of operation. The levels mark out an evolutionary improvement path from an immature process to a mature, disciplined process. The model serves as a guide for selecting process improvement strategies that lead toward a desired level of competency or maturity by facilitating the determination of key elements of current and potential process capabilities and identification of the issues most critical to process quality and improvement.It thus enables the organization to consciously choose a certain target level of maturity, and then work towards that level«.

According to Fraser et all (2002) the concepts of process or capability maturity are besides their original applications on product development, both as means of asessment and as a part of the framework for improvement, being increasingly used for a range of other activities (like quality management, software development, supplier relationships, R&D effectiveness, innovation, collaboration…). The core idea of the maturity grid is that it describes in a few phases, the typicall behaviour exibited by a firm at number of levels of »maturity« for each of the several aspects of the area under study, in our case BMI. This provides the opportunity to codify what might be regarded as good practise (and bad practise) along with some intermediate or transitional stages.

De Bruin et al (2005, p. 112) points that *»CMM has gained global acceptance and that by (2005) more than 150 maturity models have been developed.«* As such, the CMM framework offers us a viable basis for also developing embedded BMI processes.

According to Kaner and Karni (2004) the capability maturity model concept is mainly applicable to organizational processes, such as development processes or business processes, just like BMI

processes also tend to be. *»The model is intended to guide organizations wishing to improve their decision making capabilities.«* In our case, the BMI capabilities.

Based on the previous literature review the following five pillars of core capabilities of companies as crucial for BMI processes have been short listed, and we will be looking into how they interrelate among each other and into the current status of their development and distribution/maturity:

1. Vision/strategy, which include integration of innovation, integration ofBMI, integration of BMI with TTI, integration of BMI in business development and BMI strategy
2. Organization, which includes the support of management to BMI , internal BMI project management, competitive analysis of BMI, integration of customers/suppliers, integration of other external partner
3. Human resource, which includes dedicated staff to BMI, managers' own perception of BMI, BMI importance for employees, employees perception of BMI and education on BMI
4. Reward system, which includes BMI acceptancy level, BMI as good practise, BMI recognition scheme, BMI financial compensation scheme and BMI compensation scheme integration in overall reward system
5. BMI processes, which include strategic vs operative processes, reactive vs proactive processes , spontaneous vs systematic processes and incremental vs radical processes.

3.4. BMI capabilities interrelationship

Vision, in terms of what the company/organization stands for, why it exists and where it goes and consequently what is its specific and concrete mission to be accomplished, which also defines its strategy, is a basic and strategic BMI capability. It needs to clearly define the business that the company is in and the goals that it targets to obtain, including a concrete plan of how this will be done. It thus integrates the specific capabilities of innovation in general and description of their role and of how they are going to specifically contribute to the accomplishment of that mission. It includes specific definition of BMI role as a part of overall innovation efforts, interrelationship between TTI and BMI, integration of BMI as a part of overall business development processes and a specific BMI strategy as important strategic BMI capabilities. These all are core, high level strategic BMI capalities,

In order to execute the strategy and specifically BMI strategy, to make sure that it is being continuous, converted in reality on a daily basis, specific operative BMI capabilities are required. Among other, first of all, the structures need to be created within the organization in which innovation and specifically BMI are being embedded and according BMI related capabilities need to be developed, directly containing and expressing strategic BMI capabilities and enabling their conversion into practice. High level support of management to BMI is crucial and an important (while not sufficient) pre-condition for assuring the conversion of the theoretically defined role of BMI into practical value added. Within the complexity of today's business environment a well-organized internal BMI project management i.e. highly efficient and result oriented on-line management of each of the BMI projects, supported with according efficient software, is an important enabler of BMI success. The company also needs to dispose with the capability of competitive analysis of its BMI – needs to understand, where the competitors stand on BMI, how does a related BMI SWOT analysis look like and what will be done in order to take the leading position in BMI. High level of integration of customers/supplier and of integration of other external partners as BMI capabilities assure that the organization keeps the focus on BMI which are relevant in responding and anticipating customers' needs and that all of the available BMI resources based on open innovation principles are being properly utilized.

All of the organizational BMI capabilities represent and express a direct operationalization of the strategic BMI capabilities, without which they would just remain a theoretical and unsustainable declaration. Then again, also organizational BMI capabilities, in order to be properly expressed and executed, need their further deployment. Thus further core required operative BMI capabilities need to be developed within the domain of human resource and related reward system capabilities and in the

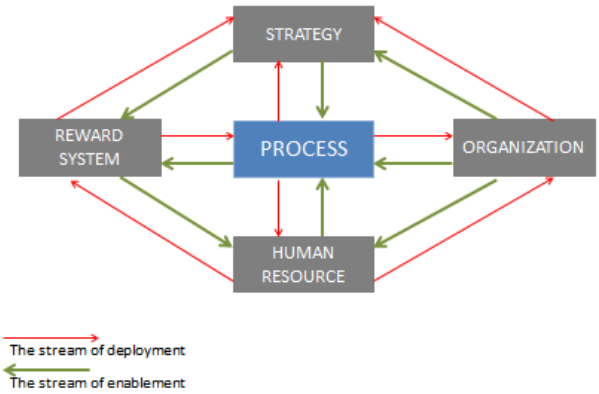
BMI process capabilities, which are linking all of the BMI capabilities together in a consistent set of strategic and operative capabilities.

All of the organizational capabilities are further coming from and are represented by and embedded in the human resource, in people, that are associated with the organization, not only and not at all its employees, but all of the stakeholders. It is human resource capabilities that develop and define all of the strategic BMI capabilities in the first place and it is human resource that converts them in the organizational BMI capabilities, required for their execution. None of these is possible unless disposing with the related human resource BMI capabilities. It requires a staff, which is profoundly dedicated to BMI, for which BMI actually is the way of operating, the way of living. Managers' own highly positive perception of BMI and highly positive perception of BM importance for all employees and other stake holders only can produce highly positive employees' perception of BMI. Intense education on BMI is while a normal consequence of all of the described BMI human resource capabilities also an indispensable one.

Along with the crucial importance of the BMI human resource capabilities and as their core and indispensable enabler, it is the motivation related with the reward system that is crucial for supporting and enhancing BMI human resource capabilities to stay in place and to develop to continually higher level. It is in the human nature to need to participate on the outcomes of certain activities in order to further take part in these activities and to try even harder. The absence of such direct results as stimulus for further investing itself into it would and does result in the overall system collapse. Rewarding the overall BMI acceptance level and continually presenting BMI as good practice have a profound impact on the level of BMI activities in the organization. They nevertheless need to be further expressed in the form of BMI recognition scheme, and in concrete terms in BMI financial compensation scheme, whereas BMI compensation scheme needs to be fully integrated into the overall reward system. It is these the highly developed BMI reward system capabilities that are motivating the human resource i.e. all of the stakeholders to perform their BMI human resource capabilities well, which are the pre-confirm for the organizational BMI capabilities to get done and for the strategy to be converted into the reality.

Capabilities, that are interlinking and crosslinking all of these BMI capabilities, are BMI process capabilities. As the matter of fact, all of the BMI capabilities yet get expressed over the BMI processes in which they are being involved and that are being executed in the company as a positive daily rutine. All of the BMI capabilities get expressed in and through these processes. BMI processes are an integral part of BMI culture, are the fundamentals of all of the BMI capabilities, in which they get employed and deployed as shown in Figure 1 below.

Figure 1: BMI capabilities and processes interrelationship



As BMI strategy capabilities as the higher order BMI capabilities are defining and are being operatively expressed in BMI organization capabilities, and as these can only function over human resource capabilities, depending on BMI reward system capabilities, it is that basic embedded BMI oriented motivation that bottom-up enables functioning of human resource and consequently organizational BMI capabilities, that deliver on BMI strategy becoming a reality. BMI processes are the central part of BMI capabilities, are the platform for deployment and enablement of BMI capabilities.

To capture the complexity and interrelation of these BMI capabilities, we in addition put forward the following image construct, based on the metaphor of a river as a continuous process that visualizes these interplaying BMI capabilities. On the banks of the river, defining and directing its flow, there are vision, values, processes, culture and strategy, while through the center there are more operational BMI capabilities, still equally important for the river micro-flow – reward systems, human resources and organization. The river itself is a constant flow of BMI.

Figure 2: BMI capabilities and processes flow

Based upon the described BMI literature landscape and by integrating its bordering theories we expect that these dynamic capabilities for innovating business models in companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. that they vary and differ substantially among the companies in the industry. Within this it is likely that a smaller number of companies have no institutionalized/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities. Across these varying levels of maturity, it is expected that the more advanced and mature BMI capabilities do correlate with better financial performance of the companies, i.e. better developed BMI capabilities are one of the important attributes of better company financial performance, also positively correlated with the positions of leaders and co-leaders in the industry. I expect that the maturity of strategy and strategic capabilities, while important and a pre-condition for successful BMI, need to be balanced with hard, operative implementation capabilities, such as organization, human resource and reward system role and impact.

It is our expectation that the differences within the level of development, i.e. maturity of these five core BMI capabilities - strategy, organization/structure, human resource, reward system and processes driving BMI - will be core for explaining the differences in BMI and consequently overall company performance. Company strategy is expected to play a decisive role as a facilitator of overall innovation activities and also specifically of the activities linked with BMI. We assume that a higher level of

dedication of company's structure to innovation and specifically to BMI will considerably positively affect the BMI and ocverall performance. We further assume that a specific dedication of knowledgeable individuals and teams to the development of BMI processes will considerably positively affect the BMI and performance as well. The presence and application of monetary and non-monetary reward elements, rewarding achievements in BMI, will positively effect BMI and performance.

Overall, based on findings and research needs in the literature, we have identified six hypotheses:

1. Dynamic capabilities for innovating business models in the companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry.
2. A smaller part of the companies still has no institutionalised/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities.
3. More advanced and mature BMI capabilities correlate with better financial performance of the companies, i.e. better developed BMI capabilities are one of the important attributes of better companies' financial performance, also positively correlated with the positions of leaders and co-leaders in the industry.
4. Maturity of strategy and strategic capabilities, while important and pre-condition for successful BMI, needs to be balanced with hard, operative implementation capabilities, such as organization, human resource, reward systems and proceses.
5. TTI capabilities are more developed/mature than BMI capabilities.
6. The combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities will result in the best companies' performance in terms of sales growth, growth of market shares and growth of profitability.

In order to check all of these hypotheses empirically, we have for the purpose of the effective execution of the research in the automotive industry developed the following practical and straightforward definition of BMI:

> *"Business model innovations is herewith, based on the theory studied and following these aims, widely understood as all non-technical/technological innovations (i.e. non product, technology or material innovations) related to value creation in companies, like for example innovations in purchasing, logistics, sales, marketing and finance."*

By providing a further "narrow" definition, focused on non-production, "non-TTI", we aim at clearly avoiding a potential confusion and mixing between TTI and BMI in companies. It is thus appropriate and useful for practical needs in terms of the research work in different industries, and was also applied in our survey in the automotive industry. Methodolgy and results will be presented in the following articles.

4. CONCLUSIONS

The BMI related literature review highlighted calls for more empirical research into how companies really display capabilities in BMI in practise, especially into those companies that excel at continually dynamically changing the very way they function through adapting to ever increasing speed of external changes and through provoking and creating these changes themselves. The literature expresses the need to investigate not only the occasional inspiration of individuals and teams, but a systematic consideration of how these can become systemic, proactive and react to the opportunities, and thus become continuous. It is this gap, this dearth of empirical studies into the "what and how" companies are doing in BMI, that we target in this research. To do this we focused on the "what and how" of a moderately dynamic industry, the European automotive industry.

The literature implicitly and explicitly suggests that the companies differ significantly in terms of their capabilities for BMI, without identifying them clearly. It led us to detecting the basic BMI capabilities and a hypothesis that dynamic capabilities for innovating business models in the companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry and that they have a normal Gaussian distribution. Moreover, the literature strongly suggests, while not delivering empirical verification, that more advanced BMI capabilities correlate with better financial performance of the companies, which we will therefore examine as well.

The literature further assumes that strategy and overall strategic capabilities, while important and pre-condition for successful BMI, need to be balanced with hard, operative implementation capabilities, such as organization, human resource and reward system role and impact, which we will accordingly verify with the survey.

TTI capabilities are according to the literature more developed/mature than BMI capabilities. The combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities is supposed to result in the best financial performance.

We are, based on related theory review, hypothesizing that dynamic capabilities for innovating business models in companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. that they vary and differ substantially among the companies in the industry. Within this it is likely that a smaller number of companies have no institutionalized/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities. Across these varying levels of maturity, it is expected that the more advanced and mature BMI capabilities do correlate with better financial performance of the companies, i.e. better developed BMI capabilities are one of the important attributes of better company financial performance, also positively correlated with the positions of leaders and co-leaders in the industry. I expect that the maturity of strategy and strategic capabilities, while important and a pre-condition for successful BMI, need to be balanced with hard, operative implementation capabilities, such as organization, human resource and reward system role and impact. Finally, our research and the related empirical work will interrogate the relationship between TTI and BMI and their capabilities. The anticipation is that the combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities will result in the best company performance in terms of sales growth and growth of profitability.

Iztok Seljak, IEDC Bled School of Management

IN SEARCH OF EMBEDDED BUSINESS MODEL INNOVATION (2): BMI CAPABILITIES DISTRIBUTION AND THEIR VISUALISATION

Bled, March, 2015

ABSTRACT

The empirical work investigates these capabilities and how they interact. Throughout history, from developments in society to the modern history of companies and corporations, the space of innovation has prioritised technical-technological innovation (TTI). The focus of this research and related four articles is different. It focuses on business model innovation (BMI). Through a quantitative survey approach to BMI in the European automotive industry, the research joins scholarly and practitioner conversations that are increasingly recognising, exploring and coming to more robust insights into the value derived from attending to innovation on the models upon which businesses operate, rather than the innovation of the products and services they offer. With conceptual and theoretical underpinnings from the resource-based view of the firm, BMI is here explored from the lense of dynamic capabilities and descriptive theories that have supported the development of capability maturity models. The results of this research speak to the value derived through BMI in conjunction with TTI as well as the value of BMI irrespective of TTI.

The traditional innovation gaze has been centred on the related structures, systems and processes for assuring a continual flow of TTI (those which have been held up as catalysts for major changes in society and organizations and consequently the sources of changing business models). This study, focused on BMI and its related BMI enabling capabilities and processes, investigates and describes how BMI exists not only to support, enable, realize and enrich, i.e. to "follow" and "escort" TTI, but is itself a set of resources and capabilities for generating new value. Moreover, BMI does not only play a supporting role but also leads, playing a solo role in efficiently integrating and upgrading existing and encouraging new TTI.

While research into BMI has been growing, there is still a dearth of empirical studies, particularly those taking a systemic look at organizational capabilities for BMI – what we referr to here as embedded business model innovation (EBMI). As such, the research presented provides significant empirically grounded, theoretically driven results that shed light on how companies approach BMI and the capabilities and processes they build to continuously do them.

The primary data for this study came from a quantitative survey approach involving high level informants from 145 companies in the European automotive industry. The study is centered on dynamic BMI capabilities in companies in the European automotive industry, exploring their relation to TTI capabilities. Furthermore, it develops a set of tools enabling companies to progress quickly towards systematic continual BMI and finally openly challenges the dominant wisdom focused on TTI. The data provides insights into how BMI, in comparison with TTI, may deliver better results both from revenue, market shares and financial viewpoints. The research provides a window into the current distribution of BMI capabilities in companies in European automotive industry and investigates the roles of strategy alongside organization, human resource structure, reward systems and processes. Ultimately the presence and relative alignment of such capabilities in companies in the European automotive industry is found to be core to the level of a company's BMI performance. In total, the findings focus on the relative "embeddedness" of BMI within companies and how this relates to company growth and performance over time.

To clearly structure, articulate and present these findings, a business model innovation/technical-technological innovation capability matrix (BMI/TTI Capability Matrix) is developed and the relations between the two are explained. Complimentary to the matrix is a five-stage model of the relative

maturity (embeddedness) of BMI capabilities within a company. This five-stage maturity framework (EBMI Capability Framework) of embedded BMI capabilities and processes (pre-phase, start-up, strategic commitment, pre-integration, integration) provides fresh insights, both theoretically and practically, in the space of innovating through business models.

The BMI/TTI Capability Matrix and EBMI Capability Framework integrate theoretical insights around BMI, dynamic capabilities and descriptive theories supporting the development of capability maturity models, bringing into relief relations between BMI and TTI. They each separately and both together represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, embedded, systematic, continuous BMI and an important tool for practitioners to adapt their companies to the ever faster changing environments and to proactively provoke productive changes within them. Moreover, the results challenge the dominant logic that the combination and cross-link/cross-integration of TTI and BMI is the best option for achieving superior company growth and performance. The results indicate that a focus solely on innovating business models may yield the highest enhancement of growth and performance.

The serial of our four related articles is step by step revealing these exiting new dimensions of BMI. While the first article developed theoretical foundations for the related research, the second article presents the applied methodology and results in terms of BMI capabilities distribution and their visualisation.

1. INTRODUCTION

In the previous article we have, based on a related theory review, hypothesized that dynamic capabilities for innovating business models in companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. that they vary and differ substantially among the companies in the industry. Within this it is likely that a smaller number of companies have no institutionalized/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities. Across these varying levels of BMI capabilities maturity, it is expected that the more advanced and mature BMI capabilities do correlate with better financial performance of the companies, i.e. better developed BMI capabilities are one of the important attributes of better company financial performance, also positively correlated with the positions of leaders and co-leaders in the industry. We expect that the maturity of strategy and strategic capabilities, while important and a pre-condition for successful BMI, need to be balanced with hard, operative implementation capabilities, such as organization, human resource and reward system role and impact. Finally, our research and the related empirical work will interrogate the relationship between TTI and BMI and their capabilities. The anticipation is that the combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities will result in the best company performance in terms of sales growth and growth of profitability.

Within this article, we are explaining the methodology applied to empirically verify all of the from the literature derived related hypotheses, describe research field and method and results in terms of BMI capabilities maturity and their visualization.

2. METHODOLOGY

Taking into consideration the type of our research questions (which are the BMI capabilities in companies, what factors do they depend on, how developed/mature are they…) and taking into consideration a substantial lack of quantitative studies in the field, quantitative survey method was choosen as the most approriate survey method. As well, for the second stage, when the companies, excelling in BMI will be detected, the qualitative survey method with profound interviews with CEOs of these BMI leading companies was invisaged. Due to the amount of available data and related complexity and required time for completion of the first step, the second step of survey is being listed as an opportunity for further research and »only« the first step of the research was conducted..

2.1. Research field

Our study is centered on understanding capabilities and maturity levels of BMI, and its interrelationship with TTI, within a single industry. The criteria for industry choice depended on identifying an industry with high levels of innovation, an industry that was mature and provided intra-industry company comparison, one that had evidence of existing BMI capabilities, and finally one that we would have access to. A cross-industry comparison is outside the scope of the study. While this was on the one side a pragmatic decision based on available time and resources, a cross-industry comparison of such phenomena, as Eisenhardt (1997) also notes, is anyway difficult due to the differing development patterns and specific industry dynamics resulting from different external factors, influencing the developments of a specific industry. Taking this into account, we chose to focus on BMI capabilities, maturity levels and interrelationship with TTI within a mature, moderately dynamic industry, and one that would provide viable material for a highly relevant intra-industry company comparison. The value of focusing on a moderately dynamic industry, one that is mature but with moderate growth lies in the ability to capture relatively stable BMI relevant information. Additionally, a moderately dynamic industry with significant maturity highlights an industry that requires a focus on innovation to drive growth. Thus, we can focus our area of research on one specific, moderately growing industry, which will enable us to catch the core factors influencing the intra-industry differences in BMI capabilities and processes to explore the most efficient and best financially performing processes and factors influencing them.

Based on all aforesaid, and matching all of the criteria to the maximum extent, the industry chosen for this study was the European automotive industry, i.e. companies active within the automotive industry based in member states of the European Union. As discussed in detail below, we gained access to the industry through CLEPA (European Association of Automotive Suppliers), a leading automotive industry association that administered the survey directly to corporate members and through its national associations across the EU.

Based on some of our previos work (Seljak, 2007) the European automotive industry is a mature, moderately growing, global high-tech industry. It continues to play a strategically important role globally as well as in the European Union. It is a major contributor to value added, accounting for approximately 3% of the EU's GDP and 7% of the EU's total manufacturing. The industry, defined as companies involved in vehicle and their equipment manufacturing, including OEMs, provides work for more than 2 million Europeans and supports an additional 10 million indirect working places in both large companies and small and medium enterprises. The scope and impact of the industry is significant as each 7th working place in the EU is associated with the automotive industry. In addition to being a moderately growing industry, it is also an industry focused on innovation, primarily TTI. The industry (company dependent) typically invests between 5 and 10 % of the yearly revenues in research and development. While this is a relative figure, the outcomes are significant as over 70 % of overall intellectual property as measured by the number of registered patents in Europe emerges from the automotive industry. These developments arise from advanced TTI related to the products, technologies, processes and/or materials involved in the industry. The automotive industry, in addition to being a mature and moderately dynamic one, also represents "the" industry in Europe with respect to R&D and consequent innovations, as measured by successful developments protected by IPR.

According to previous related work (Seljak, 2007), during 120 years of the industry's history, so far based on the internal combustion engine as the prevailing technology of the power-train, the industry has been constantly improving automotive performance through incremental innovation, though more intensively over the last ten to fifteen years. Today, the industry is facing the need for increased innovation. For example, it has been constrained by the focus on the internal combustion engine, which was originally considered as one of the least probable options for assuring the mobility of automobiles – as compared to, for example, electric engines. With diminishing fossil fuel resources, a volatile petroleum market, concerns regarding CO2 emissions and climate change, stricter environmental rules and associated legislation, the industry may be facing the end of the life cycle of

its current core technology. The industry is thus facing a significant TTI challenge. The industry itself has produced a number of intermediate solutions including those focused on alternative energy sources such as: advanced "bio" diesel, natural gas, methanol/ethanol, hybrid solutions and hydrogen. Additionally, more holistic changes have been developed and are likely to take place within the market in the coming years, involving hydrogen fuel cells and pure electric vehicles associated with renewable energy sources such as solar and wind energy. As Seljak (2007) argues, this characterizes the industry as facing an intense need for upgrading through the combination of gradual TTI (e.g. "bio" diesel) and industry changing breakthroughs (e.g. hydrogen fuel cells and fully electric vehicles drawing on renewable energy sources).

This is all to highlight the innovation context of the industry. For a mature, moderately dynamic industry, it is the most innovative industry in terms of TTI (primarily incremental, which is typical of mature industries) within Europe. Additionally, it is an industry that will further need significant focus on innovation in the near future.

In addition to a focus on TTI, the European automotive sector is also one in which BMI is already significantly present. It is an industry in which TTI, while a primary focus, is accompanied by an intensively increasing attention to BMI. For example, PSA Peugeot Citroen has for many decades been ramping up different alliances with direct competitors in co-developing and co-producing internal combustion engines, commercial vehicles and SUVs to gain on scale and decrease costs. Illustrative of this has been the co-developing and co-producing of a 1.6-liter gasoline engine with BMW for the same purpose and the whole range of diesel engines with Ford. On the other hand, Renault is introducing vehicles, addressing current non-consumers in the ultra low-cost segment. Renault is together with Dacia making a great related success. A number of joint ventures, like Daimler-Bosch and BMW-PSA are being formed to develop and produce electrical motors for hybrid and pure electric vehicles. Renault-Nissan introduced a Project Better Place as a new business model, supporting the launch of the new electrical vehicle architecture and infrastructure. Volkswagen is in that respect heavily investing in all kinds of advanced renewable energy sources to complete their own new business model to effectively address the coming green mobility of the future.

Finally, the European automotive industry is an industry that we had access to. As a significant part of Hidria's business is within the automotive industry, we had access to highly relevant channels through which we could independently distribute the survey and fully avoid a potential bias. Hidria is a member of the most prominent associations within the European automotive sector including CLEPA (European Association of Automotive Suppliers), the association through which the survey was administered. CLEPA, founded in 1959 and based in Brussels, at the time of the survey represented 92 corporate members of the world's most prominent suppliers for car parts, systems and modules and 13 National Trade and European sector associations, representing approximately 75 % of all companies active in the automotive industry in Europe. It represents more than 5 million employees and 600 billion EUR in annual sales. The national associations, through which the survey was disseminated, represented companies in the industry from: Belgium (AGORIA), Denmark (AUTIG), France (FIEV), Germany (VDA), Hungary (MAJOSZ), Italy (ANFIA), Luxembourg (ILEA), the Netherlands (RAI), Portugal (AFIA), Slovenia (ACS), Spain (SERNAUTO), Sweden (FKG) and the United Kingdom (SMMT). Of these national associations, the German association is a particularly strong actor, given the prominence of the automotive industry and TTI within the sector in Germany.

Additionally, CLEPA often engages in studies about the industry and has a history of supporting research from outside entities like McKinsey Consulting and Roland Berger. Moreover, CLEPA has a history of innovation focused research. The bulk of this research was TTI centered; therefore the BMI survey addressing the same company membership base was the first of the BMI types also for CLEPA. It represented a complimentary extension of their innovation research.

CLEPA therefore provided a viable channel through which to collect data due to its scope and credibility in the industry in the field of related research. Members of the association are used to

receiving research requests such as surveys, and many engage where possible in meeting research requests such as filling out surveys. As discussed below with regards to survey execution, working through CLEPA the survey was distributed to a total of 1036 companies within the EU automotive sector from which we received a 14% response rate.

To summarize to this point the value of this specific industry for our study, the European automotive industry provides a rich source for studying the BMI capabilities, maturity levels and interrelationship between TTI and BMI. The industry is a mature one with moderate growth levels. Furthermore, it is one characterized by continuous, though largely incremental, TTI. Moreover, it is on the way towards important break-through TTI. As discussed above in the theory chapter, such TTI often results in, or requires implementing new BMI. As the above examples illustrate, the industry is already strongly engaging in BMI activity. It offers an excellent environment to study intra-industry systematic and analytical BMI capabilities. Finally, it is an industry to which we had access. Through CLEPA, a wide ranging industry association with credibility in research activities and with members willing to respond to research requests, we were able to have the survey executed and collect relevant pan-European data.

Before moving on to describe the execution of the study we wish to address the issue of bias in the study design and execution, in particular also how the independence of the study was assured.

2.2. Research development and execution

In order to investigate the core elements of BMI, a theory-based framework of the capabilities influencing BMI was created. The factors, identified as potentially having the most important impact on BMI, i.e. the independent variables, were identified, based on the literature review. These included: industry segment, country of origin, country of origin of mother company (where applicable), global footprint, global market share, market position, age/years of operation of the company, number of employees, yearly sales volume, financial performance, role/position of the survey respondent, type of ownership structure.

The dependent variables, BMI capabilities identified for the survey, included the BMI capabilities with the consequent parameters to explore each variable. Where I sought relative levels of comparison a 5-point Likert scale was used (strongly disagree, disagree, neither agree nor disagree agree, strongly agree), for other questions (e.g. number of employees dedicated to BMI) specific data was requested.

Based on the previous literature review the following five pillars of core capabilities of companies as crucial for BMI processes have been short listed, and we will be looking into the current status of their development and distribution/maturity:

1. vision/strategy, which include integration of innovation, integration ofBMI, integration of BMI with TTI, integration of BMI in business development and BMI strategy
2. organization, which includes the support of management to BMI , internal BMI project management, competitive analysis of BMI, integration of customers/suppliers, integration of other external partner
3. human resource, which includes dedicated staff to BMI, managers' own perception of BMI, BMI importance for employees, employees perception of BMI and education on BMI
4. reward system, which includes BMI acceptancy level, BMI as good practise, BMI recognition scheme, BMI financial compensation scheme and BMI compensation scheme integration in overall reward system
5. BMI processes, which include strategic vs operative processes, reactive vs proactive processes , spontaneous vs systematic processes and incremental vs radical processes.

Furthermore, each of these areas of survey provides the data for testing the six from the literature derived hypotheses:

1. dynamic capabilities for innovating business models in the companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry.
2. A smaller part of the companies still has no institutionalised/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities.
3. More advanced and mature BMI capabilities correlate with better financial performance of the companies, i.e. better developed BMI capabilities are one of the important attributes of better companies' financial performance, also positively correlated with the positions of leaders and co-leaders in the industry.
4. Maturity of strategy and strategic capabilities, while important and pre-condition for successful BMI, needs to be balanced with hard, operative implementation capabilities, such as organization, human resource, reward systems and proceses.
5. TTI capabilities are more developed/mature than BMI capabilities.
6. The combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities will result in the best companies' performance in terms of sales growth, growth of market shares and growth of profitability.

The survey, developed to explore the above outlined BMI capabilities, was constructed to provide insights into the above listed six points and corresponding hypotheses. Within the survey we included definitions of key terms including a) business model b) BMI c) TTI. Additionally, to ensure the quality of the survey we first conducted a pre-test within Hidria, and a pilot run (n=8) with companies in the automotive industry.

First of all internal pre-tests of the survey have been executed within Hidria. Ten top managers were addressed with the survey with the aim to provide comments on its content and timing required to complete it. Most of the Hidria top managers required additional explanation of what exactly was meant by business model and BMI and some additional clarifications. According upgrades were integrated into the survey. They all confirmed that time required for completing the survey did not exceed the targeted 15 minutes. In the next step I completed a pilot-run with eight respondents from automotive companies in Germany, France, Italy and Slovenia. Except for being asked to kindly provide their observations on the questionnaire and on the overall approach of the study, the approach to them did not differ from the final execution of the full survey through CLEPA. Again valuable feed-back was received. Based on a discussion that was held with them about potential required improvements in the questionnaire we made some further minor changes to the wording of some questions. These suggestions were incorporated and a final version of the survey was completed. Across the pre-test and pilot-run, the usability of the survey – particularly in terms of completion time – was of core concern. By the end of the pilot-run, the required time for survey completion did not exceed 15 minutes, a timeframe judged acceptable for responses. The distributed survey can be found in Appendix 1.

In parallel with the development of the survey we sought agreement to have the survey administered through CLEPA. To do this a letter of request was sent to CLEPA's senior executive presenting an overview of the study, its content and research aims, including the technology behind the survey, and highlighting the value added for CLEPA and its members. Following response to this letter, it was proposed that the possibility of CLEPA supporting the study would be presented at a meeting of the CLEPA national association directors. Coming out of this meeting, there was general agreement on the value of the study, however, they requested the approval of CLEPA's Brussels based senior executive. Upon further examination of the research proposal it was recognized as clearly relevant and important for CLEPA and they expressed readiness to execute it under the CLEPA umbrella with specific stipulations regarding anonymity of the data, non-disclosure agreements and data security. The first stipulation regarded the administration of the survey by CLEPA itself. It was decided that the survey would have to be hosted and launched through the CLEPA server in Brussels. This required consultation with, and bringing up to speed, a number of individuals from CLEPA's research and IT

staff. Secondly, and with particular reference to confidentiality and data security, it was agreed that data would have to remain within CLEPA and that our access to the data would be facilitated from CLEPA through the ACS –Automotive Cluster of Slovenia, from where we would be able to access the survey results. This process assured the security and anonymity of the data. Based on agreement to these stipulations, the Board of CLEPA approved the administration and execution of the survey in late September 2012 and an internal CLEPA employee was appointed as a contact person and CLEPA project leader for the BMI study. The internal project leader coordinated the approach to the survey participants through the directors of the national associations.

Through the project lead, legal assurances were provided to participants that the research was anonymous and that all the collected data would be treated as strictly confidential and that results would only appear in the form of averages and group statistics, without any reference to specific companies. As an incentive for companies to respond, they were promised a report on study results, an executive summary, and, facilitated through CLEPA, if they so wished data about their specific company in relation to their BMI position within the industry. To obtain company specific data, respondents were asked to disclose their identity by submitting a company email address (a total of 41 responding companies out of total 145, i.e. 28 %, availed of this option).

On October 24th, 2012, CLEPA launched the BMI survey through two of their primary channels, addressing 1036 companies in the European automotive industry:

- directly from the CLEPA Brussels office to their large corporate members (at the time of the survey launch this included 91 corporate entities)
- and through CLEPA's national associations (at the time of the survey launch this included 13 national associations, of which responses came from 9) with a specific interest and involvement of the German VDA, as per the data below. Within the first three weeks 148 responses were submitted. According to the original schedule, at that time, on November 8th, 2012, the first reminder was launched, resulting in additional 23 responses for a total of 171 at the end of five weeks. The second reminder was sent on November 22nd, eliciting further 16 responses for a total of 187 company responses. From the total population of 1036 companies we received an 18% response. In reviewing the responses 42 were found to be incomplete and were discarded, leaving a total of 145 company responses for an incorporated response rate of 14%. As the survey was distributed to companies representing 75 % of all companies in the automotive industry in Europe, the 14% response rate from the population represents a 10% response rate across the industry.

The breakdown of national representation of the survey response is found in Table 1. The survey response proved to be representative of the cross-European nature of the industry. Importantly, there was significant response from the German *Verband der Deutsche Industrie* (VDA), which integrates the far strongest automotive country in Europe and one of the top three globally.

Table 1: CLEPA's BMI Survey, addressees and respondents – respond rate

COUNTRY	QUESTIONNAIRES SENT	QUESTIONNAIRES RECEIVED	SHARE IN %
Germany	360	51	14
United Kingdom	111	9	8
Spain	104	15	14
Italy	98	16	16
France	92	10	11
Slovenia	54	17	31
Austria	49	8	16
Belgium	47	3	6
Portugal	32	3	9
Denmark	18	2	11
The Netherlands	35	4	11
Switzerland	15	1	7
Luxembourg	21	6	29
TOTAL	**1.036**	**145**	**14**

The results of the analysis of respondent companies went beyond the pan-European representation, proving to be representative of the industry characteristics. The analysis of company descriptive independent variables, ranging from industry segment over national basis and type of ownership to market shares and profitability, reflected the overal structure and segmentation of the industry in Europe. Thus it is also expected to do so in terms of BMI.

2.3. Addressing potential bias

Position of Iztok Seljak as CEO of Hidria (at the same time also one of the authors of the study), a company active within the European automotive industry, and Hidria's position as a member of CLEPA, presented a significant risk for bias within the sample. Therefore we took steps, in collaboration with CLEPA, to minimise the bias and have the study run as an independent survey administered through CLEPA.

As a first step towards this, Hidria took a completely passive role in the survey. Hidria is not incorporated in the sample. Moreover, Hidria as a corporate entity is not present within the survey or accompanying documentation. Hidria was not at all visible in the frontal approach to the companies in the survey as one company or even one person looking for the data. Nowhere did the name of Hidria appear, nor was the survey run under the banner of the IEDC-Bled School of Management. The survey was strictly launched and administered by CLEPA and its national member associations. By design, the survey was administered as a survey by CLEPA.

Within this sample there nevertheless still exist potentials for bias. Companies with more highly developed BMI may have been more inclined towards responding to the survey than the companies with lower levels of developed BMI. As such, the sample would include above average representation of companies with well-developed BMI capabilities, providing a distorted picture of the current state of affairs. On the other hand, companies with less developed BMI may have viewed the survey as indicating a high degree of importance being placed on BMI, seeing a need to enhance their capabilities, and therefore responding in order to access information on BMI itself. Again, this would provide a distorted picture of the current state of affairs. Finally, companies with high levels of BMI,

seeing this as a core competitive advantage, may have been less inclined to respond with the intent of protecting this advantage. These potential biases were managed primarily through the independent nature of the survey, i.e. it was administered through CLEPA, ensuring highest level of confidentiality and data security, while also promising outcome reporting. Finally, as discussed in the following chapters, the distribution of maturity levels did not indicate a bias towards companies with particularly high or low levels of BMI. The survery results show a spread of companies along the maturity lines, indicating there was neither bias towards particularly high levels of BMI active companies nor particularly low levels of BMI active companies.

3. ANALYSIS – RESULTS

3.1. Sample characteristics

In terms of general data and positioning of companies, the sample structure enables us to credibly look at potential significant differences in the approach to BMI among different segments of the value added chain of the European automotive industry. The spread of company age is also relevant and allows us to consider the implications of longevity as related to innovation capacity. The sample expresses the typical geographical structure of the European automotive industry well and allows us relevant related conclusions in terms of studied BMI capabilities. The sample structure also enables us to understand potential differences in BMI depending on the country of origin. As the sample expresses a highly global nature of the European automotive sector, it is relevant for understanding the potential correlation between the global footprint of the companies and the development of BMI. In terms of size, the spread of companies, by employee size and sales revenue, captures the diversity of the industry, underscoring the value and validity of the sample as indicative of the overall industry.

Concerning organizational elements, the sample provides a relevant base for exploring relationships between BMI capabilities and the leadership of companies in terms of CEO tenure as well as ownership structures of the companies. Importantly, the majority of survey responses came from top management, or in the case of middle management those directly involved in innovation or marketing. Therefore, the sample gives voice to those most typically involved in organizational innovation strategies and processes.

As far as the performance of companies is concerned, as the global markets shares of the companies are well distributed and highly relevant, the sample supports the ability to draw relevant conclusions on the nature of the relationship between BMI and global market shares of the companies. It provides sufficient basis and distribution among market positions of the companies to understand the characteristics of relations between market positions of the companies and BMI capabilities. Finally, an industry relevant and well-distributed set of companies by financial performance enables us to understand its potential relationship to BMI, as well as to vice versa detect the influence of financial performance on BMI. Moreover, the sample was drawn from the company membership of CLEPA. This means the responses are a subset of 75 % of all of the companies in the automotive industry in Europe.

In order to get acquinted with the landscape of the discovered BMI capabilities distribution, we shall first look into different possible visualisations of BMI capabilities. With the support of the visualisation technics we will further describe BMI capabilities distribution in companies in the European automotive industry.

3.2. BMI capabilities visualisation

3.2.1 BMI Capabilities Table

The introduced BMI capabilities framework/model consists of five BMI capabilities pillars - sub indexes, of which each further consists of five BMI capabilities, altogether twenty-five of them. In order to express all of the five and twenty-five in the form of an integrated BMI capabilities model, we

shall be using the BMI Capabilities Table for its visualization. The BMI Capabilities Table expresses all five BMI sub-indexes, all of their constituting twenty-five capabilities and an integrated BMI capabilities index. This is accompanied by the standard deviation for each of the capabilities, as well as for each of the sub-indexes and for the BMI capabilities integral index as a whole. These elements will provide us with the measures of BMI capabilities consistency level.

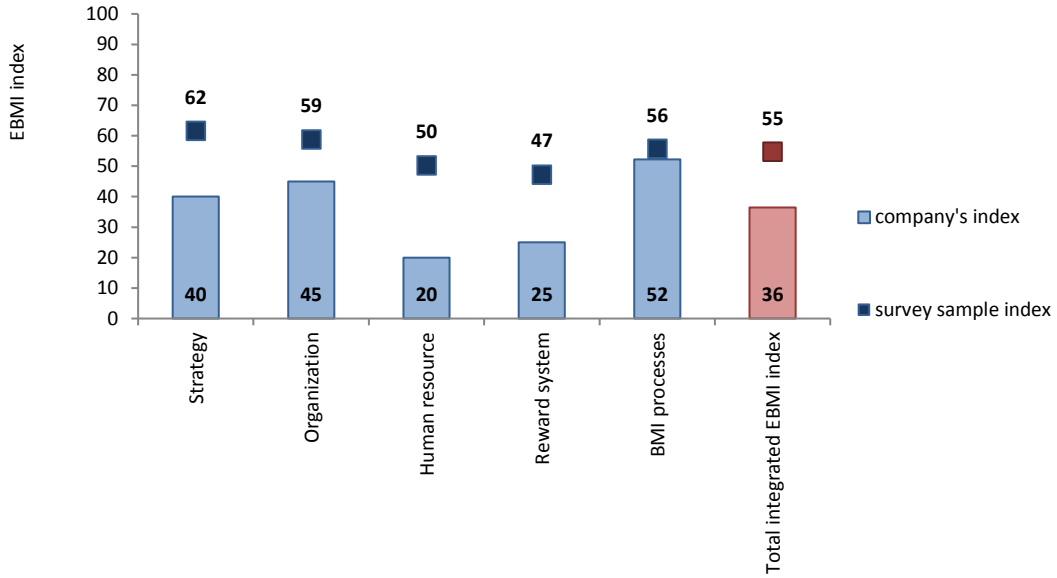
Below we overview the BMI Capabilities Table, showing BMI capabilities levels for each specific company in comparison with the overall average BMI capabilities of the sample. The results on the scale from one to five from BMI Capabilities Table are further transformed into results from zero to one hundred scale in the supporting figures.

Table 2: BMI Capabilities Table, survey based, company at level 1 vs. average

	Company	**Survey sample**	
	value	Mean	SD
Strategy	2.6	3.5	0.7
Innovation is (not) an integral part of our vision/mission/strategy and culture	4	4.3	0.8
BMI is (not) a part of our overall innovation efforts	2	3.5	0.8
We do (not) have a defined BMI strategy	3	3.0	1.0
Our BMI is (not) a part of our overall business development activities	2	3.2	0.9
Our BMI is (not) inter-connected with our technical/technological innovation	2	3.2	0.9
Organization	2.8	3.4	0.7
Our management does not support BMI	4	3.8	0.8
We do (not) follow the development of our BMI projects	4	3.4	0.9
We do (not) follow our competitors` business models	1	3.1	1.0
We do (not) involve our customers and/or suppliers in our BMI efforts	3	3.4	0.9
We do (not) involve other external sources in our BMI efforts	2	3.1	1.0
Human resource	1.8	3.0	0.8
We do (not) have anybody in the company that, fully or partly, deals with BMI	1	3.1	1.1
Managers do (not) consider BMI as a part of their regular work	3	3.3	0.9
Managers do (not) consider BMI as a part of the regular work of their team members	2	3.1	1.0
Employees are (not) encouraged to get involved in BMI efforts	1	3.0	0.9
We are (not) running any education on BMI	2	2.5	1.0
Reward system	2.0	2.9	0.8
BMI is generally (not) welcome in our company	2	3.7	0.7
Successful BMI is (not) presented and set as an example of good practice	2	3.5	0.9
We do (not) have a recognition scheme, related to BMI	2	2.6	1.1
We do (not) have a financial compensation scheme, related to BMI	2	2.2	1.0
BMI recognition/compens. scheme is (not) a part of an overall reward sys.	2	2.4	1.1
BMI processes	3.1	3.2	0.5
Operative/Strategic	4	3.5	0.9
Bottom-up/Top-down	3	3.4	0.9
Resulting in limited/massive employee participation	1	2.8	0.9
Responding to threats/Responding to opportunities	3	3.5	0.8
Reactive/Proactive	4	3.5	0.8
Coincidental/Planned	4	3.4	0.8
Spontaneous/Systematic	4	3.2	0.8
Occasional/Continual	4	3.2	0.9
Low frequency/High Frequency	2	3.0	0.8
Incremental/Radical	2	2.8	0.8
Supporting existing products/Supporting new products	3	3.4	1.0
Total integrated BMI index	**2.5**	3	1
Total integrated BMI index (tranformed 0 - 100)	**36**	55	15
BMI position (1st do 4th)	**4**	1.8	-

Table 2 presents the data about BMI capabilities as measured for one specific company, positioned in BMI Level 1, in comparison with the average data of the total sample.

Figure 7: BMI capabilities sub-indexes per BMI levels, level 1 vs the average



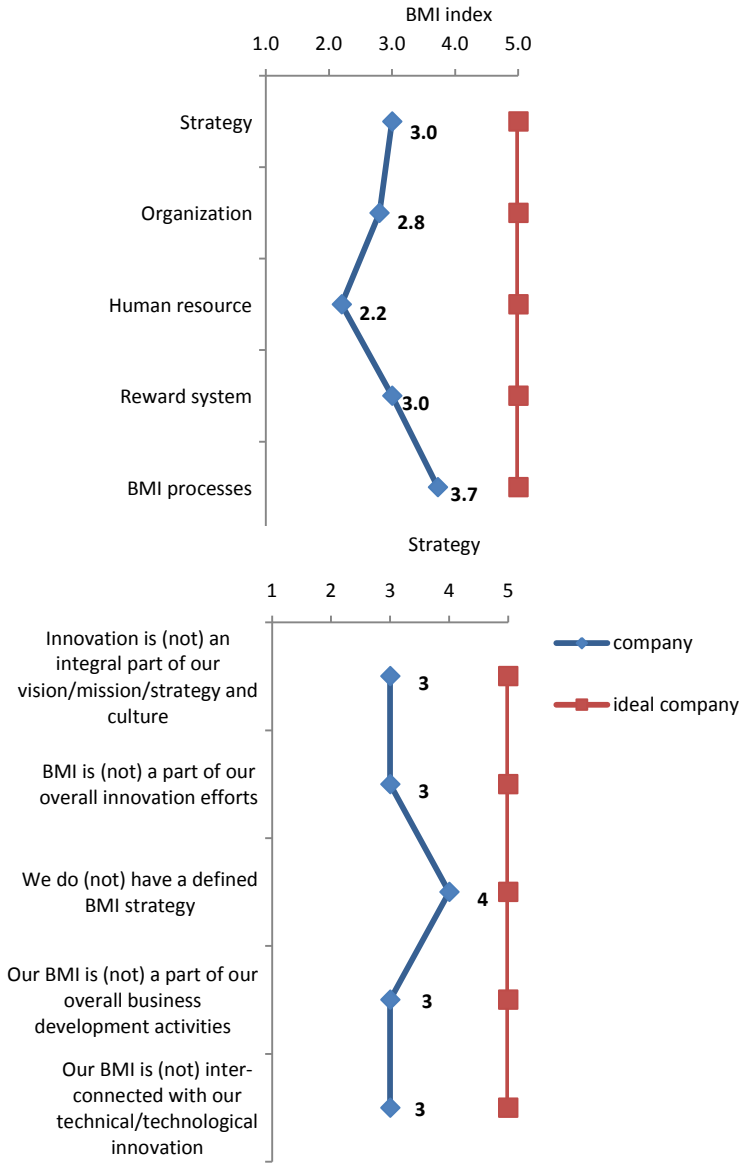
The BMI Capabilities Table shows us the current level of development/maturity of each of the BMI sub-indexes and of each of the BMI capabilities within a sub-index for a specific company, for a group of companies or for the industry. The BMI Capabilities Table as such indicates both the level of the BMI development/maturity as well as, through the standard deviation, the level of consistency/inconsistency in the BMI approach. At the same time, through the absolute delta towards a maximum capability value of 5 and through the relative standard deviation from the average capability value, which both can be added, it can also show the space available for further possible growth of each of the specific BMI capabilities. It is a kind of a BMI genome for each company, or segment, or industry. It can further be described as a kind of a BMI capabilities' "personal license", a "BMI capabilities at a glance".

Above we presented and overviewed the BMI capabilities, expressed as a BMI Capabilities Table. I explained what BMI Capabilities Table expresses and how it is used. It is a basic template for understanding a company's BMI capabilities. BMI Capabilities Table is a basis for other graphic visualizations of BMI capabilities, i.e. their current position and potentials for their further development

3.2.2. BMI Capabilities Funnel

The nominal data from the BMI Capabilities Table can also be expressed graphically in the form of BMI Capabilities Funnel.

Figure 8: BMI Capabilities Funnel – BMI index and strategy sub-index



On the left side of the graph either the sub-indexes, i.e. five pillars of the BMI capabilities, are positioned, or, if we go deeper into each of the sub-indexes, the capabilities within each of the sub-indexes. On the left side of the graph, we have the lowest value of BMI capabilities sub-indexes or of a specific capability level (1), while on the right side we have the highest value of BMI capabilities sub-index or specific capabilities level (5). The line, connecting different sub-indexes or capabilities within sub-indexes, expresses the values of sub-indexes or capabilities. Additionally, its shape/form expresses the existing level of BMI capabilities development. The more it is to the left, the less developed the BMI capabilities, the more it is to the right, the more developed the BMI capabilities.
It also visually shows the level of consistency of the related BMI capabilities approach. The straighter the line is, the more consistency there is in the BMI capabilities on any level of its development. The more jagged the line is, the less consistency there is in an overall approach to BMI capabilities, independent on the level of its development. In addition, the funnel also shows the possibilities for improvements, expressed with the available space/surface between the BMI capabilities line and the highest obtainable limits of the BMI capabilities on the right.

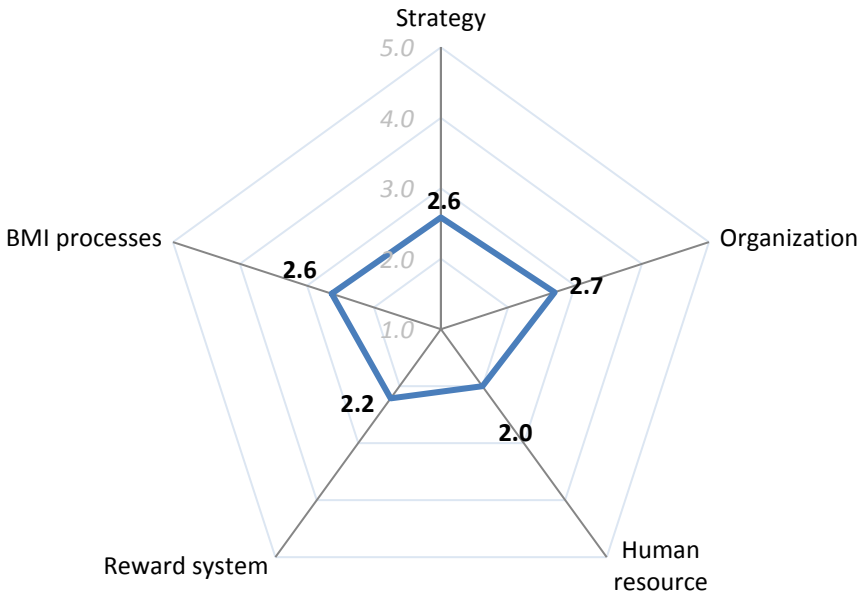
3.2.3. BMI Capabilities Pentagram

The third visualization of the BMI capabilities is in the form of a pentagram. It is valuable since it shows us multidimensional relations between each of the sub-indexes and their capabilities as well as most plastically expresses the available/required priority improvement in BMI capabilities of the company or industry.

The center of the pentagram expresses the lowest possible level of BMI capabilities index, i.e. all sub-indexes (in such case value 0), or of the capabilities within each of the BMI capabilities sub-indexes. The outer right points and the outer right line connecting them (value 5) expresses the maximum possible level of overall BMI capabilities development/maturity. Thus the delta space between both lines, between the outer line and the line that a company is currently scoring, shows the available space for improvements in BMI capabilities. Such a graph, besides the previous two shown approaches, BMI Capabilities Table and BMI Capabilities Funnel, is a consistent part of a company's basic BMI capabilities analysis. Below graphs are shown for each of the levels of BMI capabilities development as well as for a comparison between them.

The lower the level of BMI capabilities line in the pentagram, i.e. the closer to the center, and the more jagged the line, the less developed and the less integrated, consistent, balanced and the less mature BMI capabilities of the companies are. The more straight/balanced the line and the higher the level of the line from the center, that is the closer to the outer ideal line, the more developed and integrated, consistent, balanced and the more mature BMI capabilities approaches of the companies are.

Figure 9: BMI Capabilities Pentagram, level 1 average vs ideal company



The overall development of the BMI capabilities can through such visualization also be measured in terms of the surface of the pentagram. The larger the surface of the already developed BMI capabilities, the higher the development of the BMI capabilities model and the smaller the remaining area for further possible improvements, i.e. for further development in the field of BMI. Vice versa, the smaller the surface of the already developed BMI capabilities, the larger the remaining area for further possible improvements, i.e. for the development in the field of the BMI capabilities. This

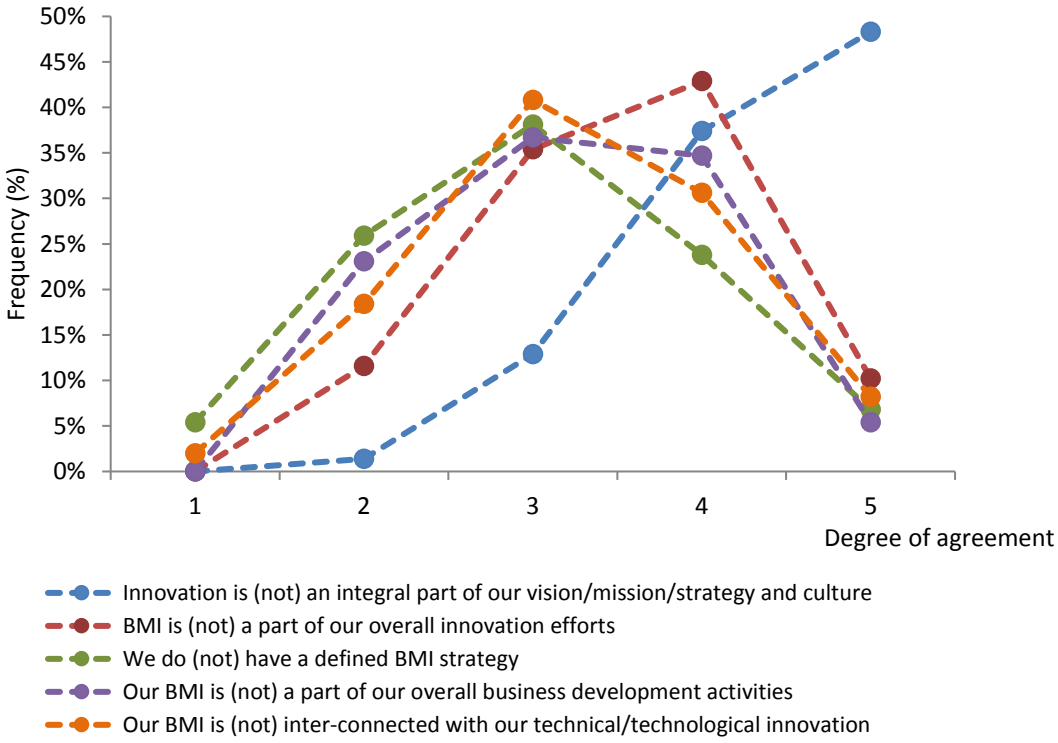
surface by its mathematical nature shows the influence both of the integrated BMI capabilities index as well as due to the nature of the lines also of the standard deviation between the indexes and thus represents a very valuable integrated visual graphical tool for understanding the status of BMI within the company, industry, country, and for understanding the required further improvements and their priorities.

BMI Capabilities Pentagram shows us multidimensional relations between each of the capabilities sub-indexes and their capabilities as well as most plastically expresses the available/required priority improvement in BMI capabilities of the company or industry.

We shall now be looking into the current maturity levels of the researched BMI capabilities in companies in the European automotive industry and their distribution.

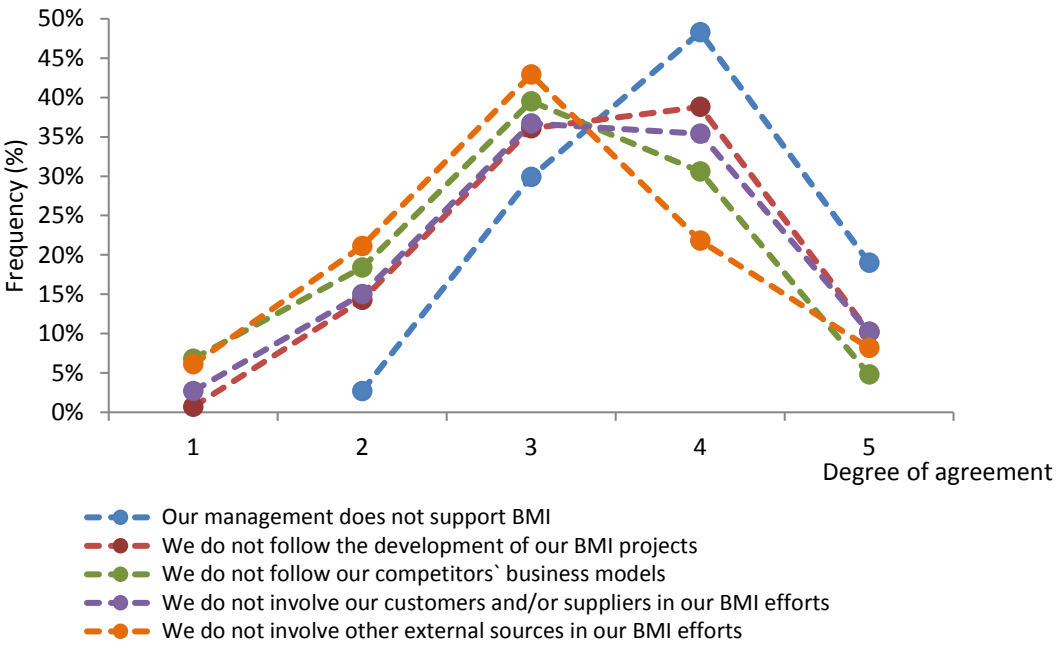
3.3. BMI capabilities distribution

Figure 1: Strategy



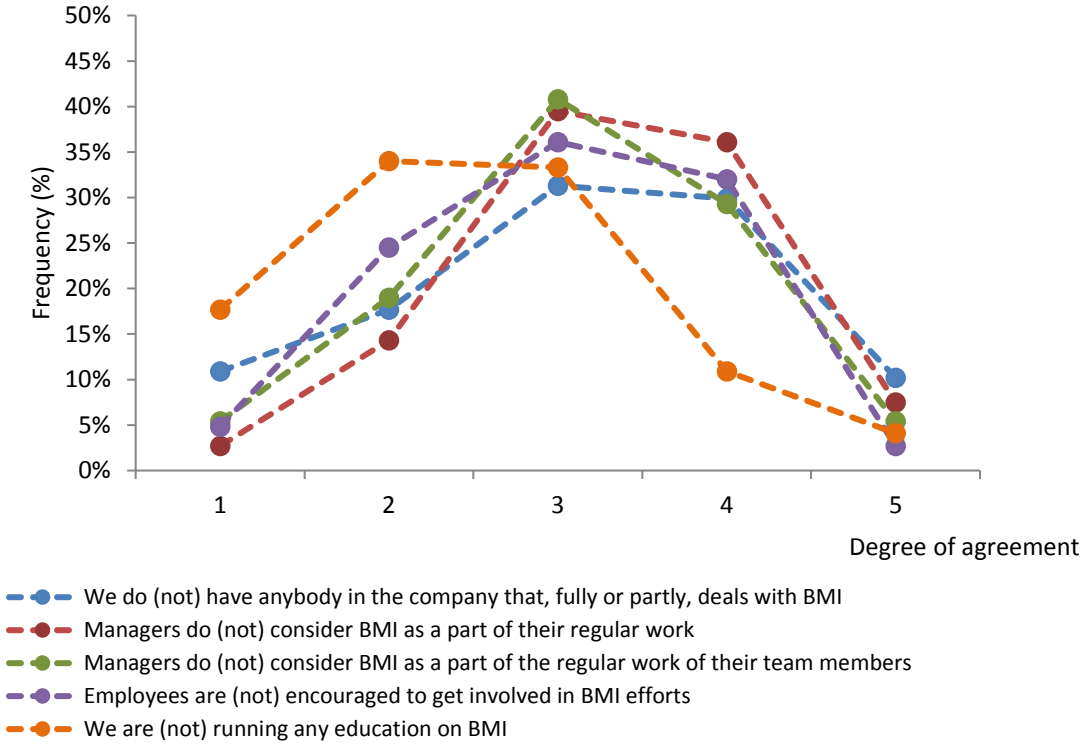
In the strategy part, we quickly notice a very different distribution curve of (overall) innovation strategy and culture capabilities towards the rest of BMI related capabilities. It is the only capability among five present here that is dealing with innovation more in general and thus traditionally to a large extent implies foremost TTI and not BMI. It expresses a very different nature of TTI vs BMI, which in one or the other way are clearly implied in all of the rest of the four capabilities. It directly underlines a much higher maturity of TTI capabilities vs BMI related capabilities.

Figure 2: Organization



In case of all of the organizational capabilities we have a close to normal distribution, while "Management support to business model innovation" differs in terms of being graded as far the strongest among all organizational capabilities. A capability of an overall support of management to BMI is scoring high - which is not surprising given that respondents were themselves middle to senior managers. On the other hand, the operative and implementation capabilities of following or not competitors' business models and of involving or not external sources in BMI efforts are considerably lower. That is, on a general, declarative level management supports BMI highly, while all of the four more operative capabilities, required for operationalizing BMI, are lagging behind.

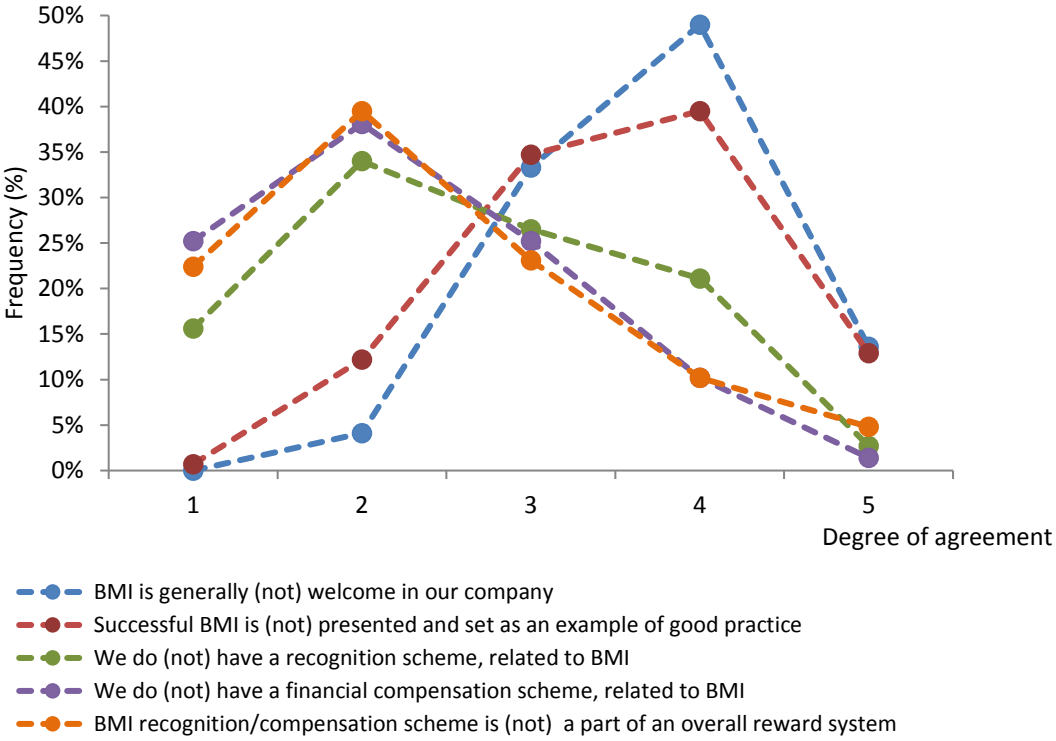
Figure 3: Human Resource



The

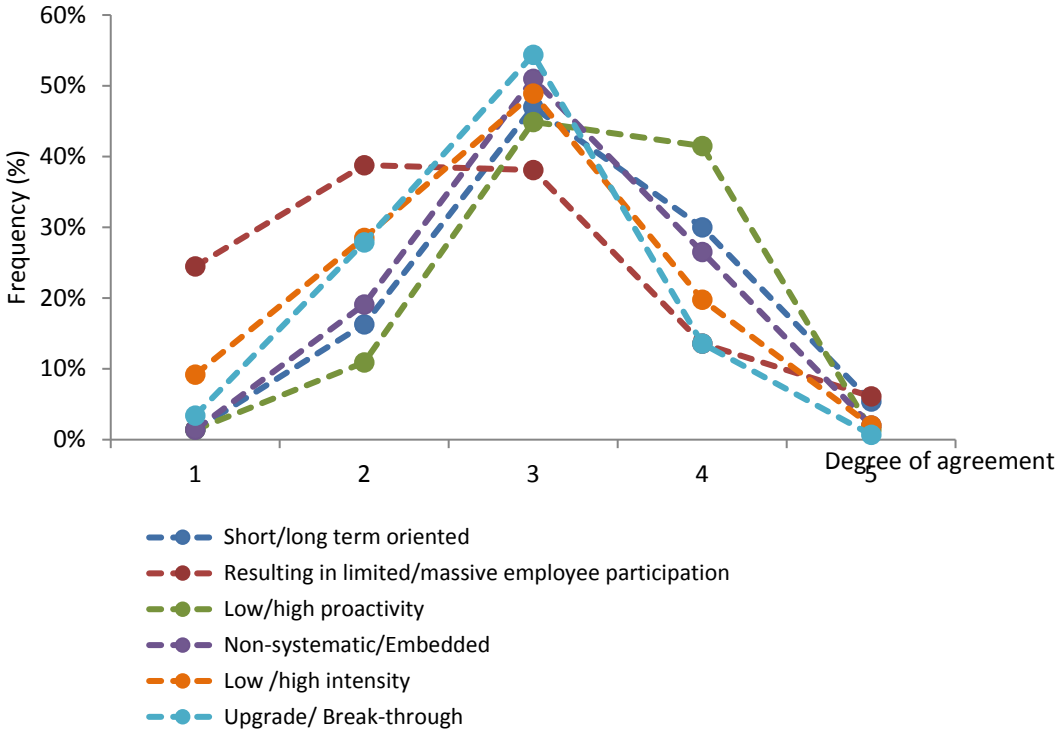
Distribution chart of human resource capabilities within its sub-index in **Error! Reference source not found.**3 clearly shows a huge negative discrepancy at one specific capability, at "We are running education on business model innovation". A capability of managers considering BMI as a part of their job or not is the highest, while a very crucial operative/implementation capability of running or not any education on BMI is very low, the second lowest of all of the 25 BMI capabilities. This indicates that while management is thinking about and is somewhat focused upon BMI, companies are lacking processes and support in really "doing" BMI. A largely underestimated importance of education on BMI here clearly appears as one of the major causes for BMI lagging still so much behind TTI. It in parallel raises the issue of an overall requirement for an enhanced BMI education programs not only in companies, but in academia and specifically in business schools and wider in universities.

Figure 4: Reward System



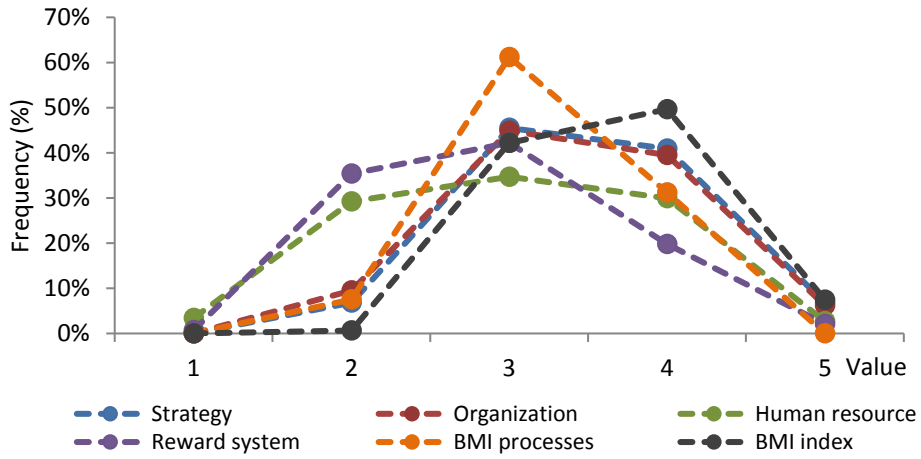
While successful BMI is frequently presented and set as an example of good practice ("Successful business model innovation is presented and set as example of good practice"), there is a large drop towards the presence of a concrete execution. Recognition scheme, related to BMI and BMI recognition/compensation schemes as a part of an overall reward system differ significantly from declared support to BMI. In addition, financial compensation scheme related to BMI is hitting the lowest point of all reward capabilities and even an overall lowest position within all of the 25 capabilities considered. On one hand, we see a high leveled general appreciation for BMI. On the other hand, the lowest of all of the 25 BMI capabilities is on the financial compensation scheme, related to BMI. Figure 4 thus clearly demonstrates a huge gap between "wishful thinking" and "reality" in terms of a reward system, oriented towards supporting BMI capabilities and processes in companies. This finding suggests that while companies in principle value, or see the potential in BMI, most are not acting upon this in an intentionally systematic way.

Figure 5: Processes



The BMI processes seem overall to still be of a rather low level. They are resulting in limited instead of massive employee participation. They are incremental rather than radical. The survey results indicate to a large extent, BMI is still the domain of the top and only partially of the middle management. Companies do not yet manage to involve a wider number of the rest of the employees. While there seems to be a tendency towards high proactivity vs reactivity, which shows that companies are moving and advancing on the BMI scale, there is the lowest score within the sub-index on one of the most important operative/implementative elements, the lack of involvement of employees in BMI.

Figure 6, BMI Capabilities Overall



The strategy sub-index, scoring the highest of all of the four BMI sub-indexes, shows that the strategic – in a way, "theoretical" – part of the BMI is the most developed of all of the BMI capabilities. The

rest of the three BMI capabilities sub-indexes, each expressing its own dimension of the BMI implementation (i.e. the "practical" part of the BMI) are substantially lower. This is especially valid for the human resources capabilities, related to BMI, and even so much more for the BMI related reward system capabilities. BMI processes score around the average rate.

Comparing the distribution of each of the five BMI capabilities sub-indexes, we can clearly notice important differences among them, both in terms of their distribution as well as in terms of their average level. Strategy has the highest BMI capabilities sub-index, while there is a falling trend over organization, human resource, reward system and processes sub-indexes, clearly indicating an important gap and disequilibrium between strategy on one side and core elements of its implementation on the other side. Companies differ most within the capabilities of the human resource pillar, while they are most aligned in the current status of their BMI processes.

Besides a general finding that the strategy part as a sub-index is on a much higher level than the other operative/implementation sub-indexes, we can clearly trace the same relation also within each of the separate sub-indexes.

Companies besides having the lowest developed capabilities in the most important operative/implementative areas, also have the largest discrepancies among themselves in terms of how they deal with these capabilities exactly in the same group of operative capabilities. There are large differences between them and no consistency yet developed. This is valid both for the comparison among BMI capability pillars-sub-indexes themselves as well as for the comparison between the capabilities within each of the sub-indexes.

The coefficient of variability of capabilities is much higher in the human resource and reward system (28 and 27 % respectively) than in strategy with 20 %.

We can detect the same pattern also within the specific BMI capabilities sub-indexes themselves. In strategy, for example, a strategic capability of "Innovation is (not) an integral part of our strategy" has the lowest standard deviation on the level of 0.75, while it is steadily increasing through the rest of more operative capabilities. In organization, companies are most aligned in the strategic factor "Managers do (not) consider BMI as a part of their work", while we are facing a huge increase of standard deviation through all of the rest of more operative capabilities. In the human resource pillar, the lowest variation is in the most strategic capability "Managers do (not) consider BMI as a part of their regular work", while it steadily increases through the rest of more operative capabilities. Similar results are found with respect to reward systems, the variation is the lowest in "BMI is generally (not) welcome in our company", the rest of the operative factors vary much more. In the processes, variation is lowest within "non-systematic/embedded processes", which is strategic; it then increases though the related operative BMI capabilities.

All this confirms that strategic BMI capabilities are consistently and with smallest differences among companies developed to a much higher degree than the operative BMI capabilities, which are developed much less and in addition to this differ much more. This additionally underlines the need for consistent advancements in these operative fields and calls for a certain type of at least fundamental standardization.

Overall, as step by step concluded in the above analysis of the distribution of the BMI capabilities, companies are in each of the pillars of the BMI capabilities evidently much stronger on the strategic part of the BMI capabilities and much weaker on the operative /implementation side of BMI capabilities. This misalignment needs to be rectified if companies are going to succeed with their BMI. It indicates that there is a desire, but a lack of follow-through with systematic actions. Therefore, managers need to inter-connect their BMI with their TTI much more than they currently do, they need to integrate it into their overall business development activities within a well-defined BMI strategy that goes beyond strategy into systematic implementation. Managers need to consider BMI as a part of the regular work of their team members, they need to encourage their employees to get involved in

BMI efforts and, before everything else, they need to run extensive education on BMI, which has so far been neglected. Further, they need to develop recognition schemes related to BMI. These schemes should become a consistent integral part of an overall reward system, including a financial compensation scheme related to BMI. Finally, the processes that are run to support BMI, according to need to change. They need to become more proactive, more long term oriented, truly embedded, more intense, break-through, and, finally, really resulting in mass employee participation. All of these improvements should have a decisive contribution in enhancing BMI capabilities of companies.

While there is important variation in the results, providing us important insights in current status of BMI capabilities and suggesting required activities for enhancing them, also common overall average trends have been found. The most striking is the normal distributions across all of the data. Generally, in each variable we have seen a Gaussian function, a normal distribution of companies along the spectrum and have described the behavior of each of them per se and in their comparison with the others within the capabilities sub-index and towards the integrated BMI capabilities index.

Hypothesis 1	Dynamic capabilities for innovating business models in the companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry. **CONFIRMED**

Hypothesis 2	A smaller part of the companies still has no institutionalised/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional business model innovation capabilities. **CONFIRMED**

At the same time, the capabilities also vary substantially among themselves in the first place and are in very different stages of their maturity. Typically, capabilities linked with strategy and human resource, i.e. with soft elements, are more developed, i.e. have a higher maturity, while the capabilities linked with more operational areas, like organization and reward system, are less developed, i.e. have a lower maturity.

4. CONCLUSIONS

We have developed three different possible visualization tools to provide a snapshot of the current status of BMI capabilities in the companies, to define the required improvements, implement them and based on that monitor the progress in business model innovation achievements: BMI DNA Table, DNA Funnel and BMI DNA Pentagram.

Based on the study of 145 companies in the European automotive industry, we have confirmed that dynamic capabilities for innovating business models in the companies in the European automotive industry have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry. A smaller part of the companies still has no institutionalised/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional BMI capabilities.

We have analyzed the structure and distribution of each of these BMI capabilities all over the sample, shown and confirmed their Gaussian, i.e. normal distributions as well we have described the behavior of each of them per se and in their comparison with the others within the sub-index and towards the integrated BMI index.

Strategy tends to currently be on a much higher level than the other "operative/implementation" sub-indexes. We have clearly traced the same tendencies of relations also within each of the separate sub-indexes. Within the organization sub-index, the capability of an overall support of management to BMI tends to score high, while the operative and implementation elements of following or not competitors' business models and of involving or not external sources in BMI efforts tend to be considerably lower.

The same is true for the human resource sub-index. A capability of managers to consider BMI as a part of their job or not appears the highest, while a very crucial operative/implementative capability of running or not any education on BMI appears very low, the second lowest of all of the twenty-five BMI capabilities. Within the reward system capabilities, there tend to be the same differences between a high leveled general appreciation on BMI within the companies on one hand and the lowest of all of the twenty-five capabilities, a big lack of a financial compensation scheme, related to BMI.

It even goes for BMI processes in exactly the same content and context. While there seems to be a tendency towards high proactivity vs reactivity, which shows that companies are moving and advancing on the BMI capabilities scale, there appears to be the lowest score within the sub-index on one of the most important operative/implementative capabilities, which is in still not reaching massive employee participation in BMI.

Overall, companies are in each of the pillars of the BMI capabilities evidently much stronger on the strategic part of the BMI capabilities and much weaker on the operative /implementation side of BMI capabilities. strategic BMI capabilities are consistently and with smallest differences among companies developed to a much higher degree than the operative BMI capabilities, which are developed much less and in addition to this differ much more

Iztok Seljak, IEDC Bled School of Management

IN SEARCH OF EMBEDDED BUSINESS MODEL INNOVATION (3):

BMI AND FINANCIAL PERFORMANCE AND BMI//TTI CAPABILITY MATRIX

Bled, March, 2015

ABSTRACT

Throughout history, from developments in society to the modern history of companies and corporations, the space of innovation has prioritised technical-technological innovation (TTI). The focus of this research and related four articles is different. It focuses on business model innovation (BMI). Through a quantitative survey approach to BMI in the European automotive industry, the research joins scholarly and practitioner conversations that are increasingly recognising, exploring and coming to more robust insights into the value derived from attending to innovation on the models upon which businesses operate, rather than the innovation of the products and services they offer. With conceptual and theoretical underpinnings from the resource-based view of the firm, BMI is here explored from the lense of dynamic capabilities and descriptive theories that have supported the development of capability maturity models. The results of this research speak to the value derived through BMI in conjunction with TTI as well as the value of BMI irrespective of TTI.

The traditional innovation gaze has been centred on the related structures, systems and processes for assuring a continual flow of TTI (those which have been held up as catalysts for major changes in society and organizations and consequently the sources of changing business models). This study, focused on BMI and its related BMI enabling capabilities and processes, investigates and describes how BMI exists not only to support, enable, realize and enrich, i.e. to "follow" and "escort" TTI, but is itself a set of resources and capabilities for generating new value. Moreover, BMI does not only play a supporting role but also leads, playing a solo role in efficiently integrating and upgrading existing and encouraging new TTI.

While research into BMI has been growing, there is still a dearth of empirical studies, particularly those taking a systemic look at organizational capabilities for BMI – what we referr to here as embedded business model innovation (EBMI). As such, the research presented provides significant empirically grounded, theoretically driven results that shed light on how companies approach BMI and the capabilities and processes they build to continuously do them.

The primary data for this study came from a quantitative survey approach involving high level informants from 145 companies in the European automotive industry. The study is centered on dynamic BMI capabilities in companies in the European automotive industry, exploring their relation to TTI capabilities. Furthermore, it develops a set of tools enabling companies to progress quickly towards systematic continual BMI and finally openly challenges the dominant wisdom focused on TTI. The data provides insights into how BMI, in comparison with TTI, may deliver better results both from revenue, market shares and financial viewpoints. The research provides a window into the current distribution of BMI capabilities in companies in European automotive industry and investigates the roles of strategy alongside organization, human resource structure, reward systems and processes. Ultimately the presence, maturity and relative alignment of such capabilities in companies in the European automotive industry is found to be core to the level of a company's BMI performance. In total, the findings focus on the relative "embeddedness" of BMI within companies and how this relates to company growth and performance over time.

To clearly structure, articulate and present these findings, a business model innovation/technical-technological innovation capability matrix (BMI/TTI Capability Matrix) is developed and the relations

between the two are explained. Complimentary to the matrix is a five-stage model of the relative maturity (embeddedness) of BMI capabilities within a company. This five-stage maturity framework (EBMI Capability Framework) of embedded BMI capabilities and processes (pre-phase, start-up, strategic commitment, pre-integration, integration) provides fresh insights, both theoretically and practically, in the space of innovating through business models.

The BMI/TTI Capability Matrix and EBMI Capability Framework integrate theoretical insights around BMI, dynamic capabilities and descriptive theories supporting the development of capability maturity models, bringing into relief empirically studied relations between BMI and TTI. They each separately and both together represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, embedded, systematic, continuous BMI and an important tool for practitioners to adapt their companies to the ever faster changing environments and to proactively provoke productive changes within them. Moreover, the results challenge the dominant logic that the combination and cross-link/cross-integration of TTI and BMI is the best option for achieving superior company growth and performance. The results indicate that a focus solely on innovating business models may yield the highest enhancement of growth and performance.

In the previous two articles, we have developed theoretical foundations for the research and presented the applied methodology and results in terms of BMI capabilities visualization and their distribution. Within this article, BMI/TTI Capability Matrix is developed and presented.

1. INTRODUCTION

Based on the study of 145 companies in the European automotive industry, we have in the previosu two articles developed three different possible visualization tools to provide a snapshot of the current status of BMI capabilities in the companies, to define the required improvements, implement them and based on that monitor the progress in business model innovation achievements: BMI DNA Table, DNA Funnel and BMI DNA Pentagram.

We have confirmed that dynamic capabilities for innovating business models in the companies in the European automotive industry have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry. A smaller part of the companies still has no institutionalised/organized capabilities for innovating business models, a vast majority of the companies have at least some and a very small number of companies, again, have established advanced functional business model innovation capabilities.

Overall, companies are in each of the pillars of the BMI capabilities evidently much stronger on the strategic part of the BMI capabilities and much weaker on the operative /implementation side of BMI capabilities. strategic BMI capabilities are consistently and with smallest differences among companies developed to a much higher degree than the operative BMI capabilities, which are developed much less and in addition to this differ much more

In this article, we will explain the relationship between BMI capabilities and financial performance of the companies, we will introduce the relationship between BMI and TTI and develop and present TTI/BMI Capability Matrix.

2. BMI AND FINANCIAL PERFORMANCE – FROM MYTH TO REALITY

When running the analysis on BMI capabilities as related to the "static" financial performance measurements (short-term financial results, current market share and current market position), we only found some, while not overall present and consistent correlation. That is to say, based purely on the financial performance in 2009-2012 and market share and current market position in 2012, there is only partial statistically significant correlation between how much a company had a developed BMI capability and that company's performance within that short time frame.

Given this result and the need to understand more and what has so far been hidden, we expanded the exploration to include change over longer time period. This brought into the analysis the focus on: i) speed of growth (SOG) ii) speed of gaining market share (SOMS), and iii) speed of profitability (SOP) and their relation to BMI capabilities to check upon change/development over longer period of time. This change over time perspective is discussed in this article, as the inclusion of company performance change over longer time period provided new insights into the relationship of BMI capabilities and company financial performance.

2.1. Speed of growth (SOG)

We are looking at the speed of growth of companies, as measured over time. We are interested here in checking if BMI capabilities had any statistically significant impact on performance when looking at the relative growth of the company over time. We consider growth as a function of yearly sales over the company age, i.e. "speed of growth" (SOG). SOG is defined as an independent variable, which is used to further deeper analyse the relations between BMI capabilities and company performance. It enables us to capture the highly relevant correlation, i.e. dependency between the SOG of companies and BMI capabilities levels, i.e. BMI maturity.

Due to the fact that in terms of SOG we only have data about current sales and decade of the company's foundation available from the field research at this point, SOG is as an approximation calculated as the ratio between current yearly sales of the company and the average of the time period/years of existence of the company (that is, the time that has been required to come to such level of sales), calculating the medium year of the decade of the foundation of the company:

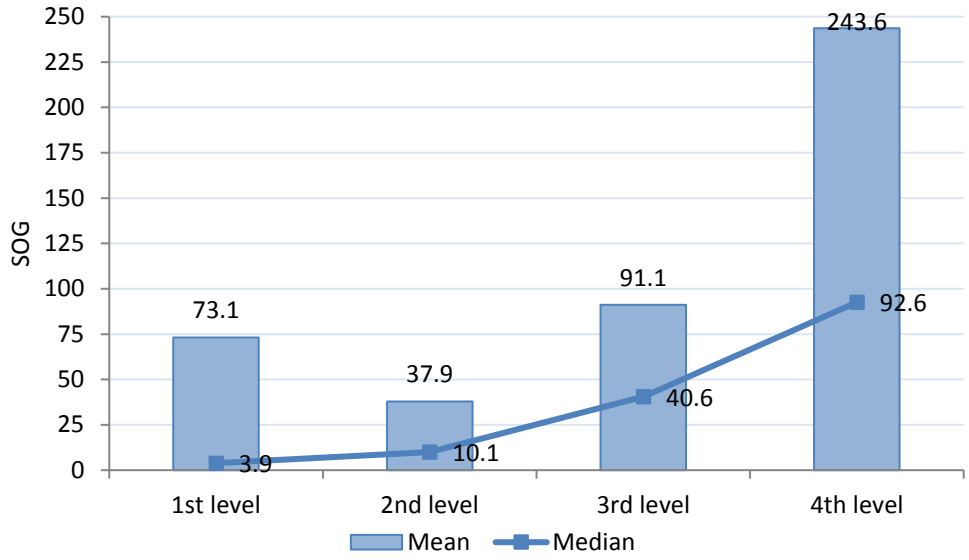
SOG = current yearly sales/number of years since foundation

and is expressed in mio EUR of sales growth per year since the start of the company.

SOG is within this study estimation, based on the available survey data of reported yearly sales related to the decade of founding. As such, this is the best available approximation of average SOG.

From this analysis, we are getting a very high correlation between BMI capabilities and company performance when SOG is taken into account, particularly for the smallest number of companies positioned at level 4, i.e. the highest level of BMI capabilities. The following figure maps this data graphically.

Figure 1: The structure of the companies per SOG, BMI capabilities level



In terms of SOG mean, it has a growing trend depending on the BMI capabilities level, with a discrepancy in the second level of BMI capabilities. In terms of the SOG median, being much more relevant considering the much diversified structure of our sample in terms of the size of the companies, we see a very consistent statistically relevant growth of the SOG median depending on the BMI capabilities levels. The differences are statistically significant. SOG in the companies, as a measure of a relative growth performance of the companies, expressed in added millions of EUR sales per year, is strongly related to the BMI capabilities levels. Since there is a small number of companies' in the sample, contributing a very large part of growth in sales, more than the mean it is the median that is a more relevant demonstrator of the SOG.

We have introduced SOG as an indicator of relative long term sales growth performance of the companies and have confirmed that it is strongly positively related with the level of BMI capabilities.

2.2. Speed of gaining market share (SOMS)

The second change over time indicator considered is the speed of gaining market share (SOMS). For this study the SOMS was calculated by market share percentage over age of company in years:

SOMS = market share in %/age of the company in years

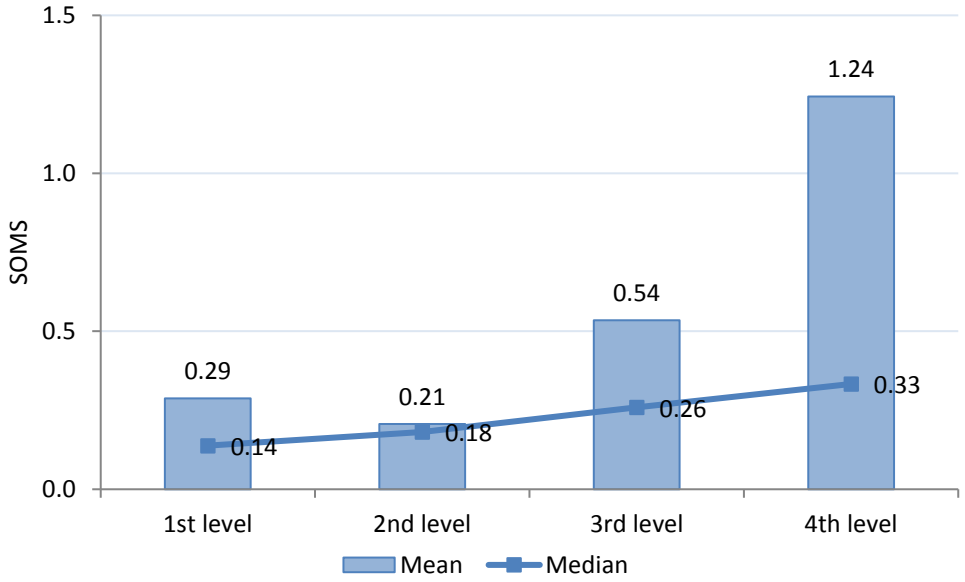
SOMS is then expressed as % of the market share added per year since the start of the company.

SOMS expresses the speed in which the company has been gaining market share since its foundation. The higher the value of SOMS, the faster the company has been gaining market share in the past. The lower the value of SOMS, the slower the company has been gaining the market share in the past:
On average, for the whole sample the mean speed of gaining market share is 0.5 % of added market share per year, while the median speed of gaining market share is 0.23 % of added market share per year. Dealing with a relative factor here, the differences between mean and median, despite the much-diversified sample, are being excluded. The minimum is almost 0, expressing no market share growth, while the maximum is on the level of 11.5 % per year, expressing 11.5 % average added market share per year.

Most importantly, we are also here at SOMS, in addition to SOG, clearly detecting highly statistically significant and relevant differences in terms of SOMS, depending on the BMI capabilities level. In median checks, companies with increasing BMI capabilities gain market share faster than those with

less developed BMI capabilities. With an exception at the level 2, the same holds true for the mean market share increase.

Figure 2: The mean values and medians of SOMS per level of BMI capabilities



In terms of SOMS mean, it has a growing trend depending on the BMI capabilities level, with a discrepancy in the second level of BMI capabilities. In terms of the median, being much more relevant considering the much diversified structure of our sample in terms of the size of the companies, we see a very consistent statistically relevant growth of the SOMS median correlated to the BMI capabilities levels. The differences are clearly statistically relevant. SOMS, expressed in added % of market share per year, is strongly correlated to BMI capabilities levels.

It is worth noting here again that both in terms of SOG and SOMS, with respect to the mean results, there is a dip in level 2 of BMI capabilities. While more research is required, this suggests that there is an adoption lag in BMI from the start (level 1) to clear positive results (level 3). Put another way, companies that begin with BMI capabilities development may see initial gains, followed by a small decrease, before realizing more significant gains in both SOG and SOMS.

We have introduced SOMS as an indicator of relative growth of market shares. We saw a very consistent statistically relevant growth of the SOMS median correlated to the BMI capabilities levels. SOMS, expressed in added % of market share per year, is strongly correlated to BMI capabilities levels.

Having looked at SOG and SOMS, below we explore the change over time performance of a company in terms of profitability change over time, speed of profitability (SOP).

2.3. Speed of profitability (SOP)

In order to re-check the already detected relations between SOG and SOMS (as indirect measure of company performance) and BMI capabilities and to specifically check upon a direct relationship between levels of BMI capabilities and company financial performance, we will conceptualize an additional new relative measure of profitability. We shall be referring to it as speed of growth of profitability, SOP. SOP will enable us to check on the relationship between the levels of BMI capabilities and direct financial performance of the companies, as expressed by such (relative) profitability measures.

Taking into consideration the available data from the study (disposing only with relative measures of profitability in time, a descriptive scale of "well below average, below average, average, above average, well above average") we are herewith defining SOP as the average 2009-2012 relative profitability, divided by the company age in years:

SOP = descriptive measure of profitability (1-5)/years of company's existence.

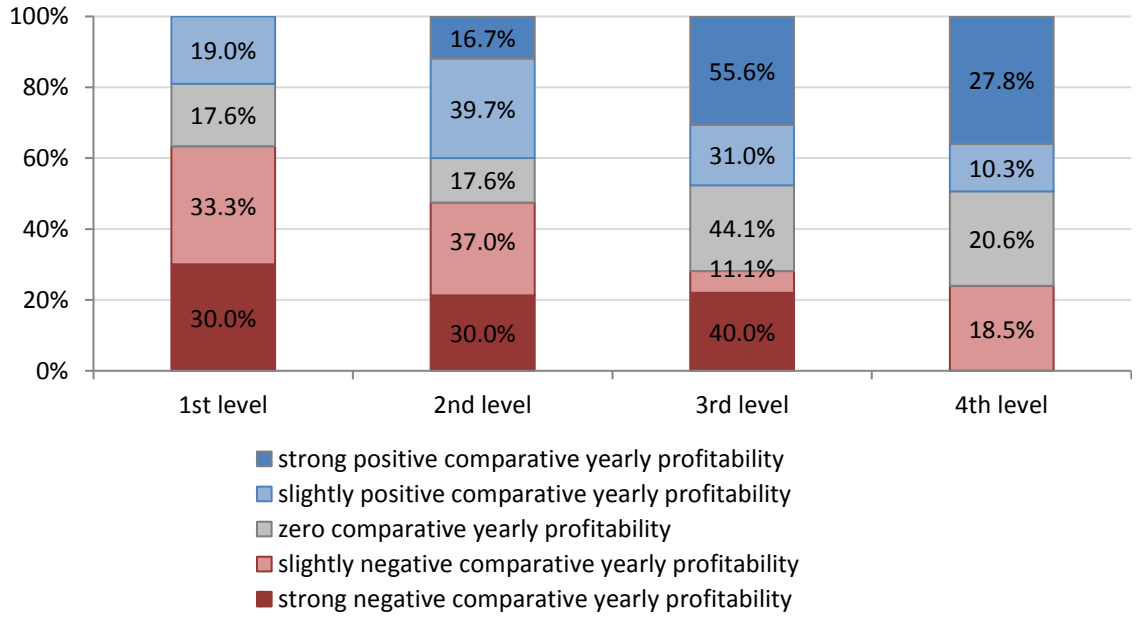
This is expressed by the SOP ratio - a smaller one describing lower profitability and a higher one describing higher profitability.

We have thus taken the five descriptive levels of profitability ("well below average, below average, average, above average and well above average") and have marked them with ponders 1 to 5 respectively. In addition, we have divided this relative measure of profitability (its average for all of the 4 years, 2009-2012), with the number of years of existence of the companies, to get a relative measure of growth of profit, i.e. profitability generation. That is, SOP expresses the ratio between the level of profitability and the number of years required to reach that profitability. It expresses a relative performance in terms of profitability of companies in time and provides a good measure for their differentiation in terms of profitability and shall enable us to check on the link between such identified profitability and BMI capabilities.

As the result, 56 % of companies with the highest SOP come from BMI capabilities level 3 and 28 % come from BMI level 4, that is, altogether 86 % come from an above average BMI capabilities zone. Only 16.7 % come from BMI level 1 and 2, that is, from below average BMI capabilities zone. On the opposite side, 30 + 30, total 60 % of the companies in group 1 with the lowest SOP, are represented by the companies coming from the under average BMI capabilities level 1 and 2.

In addition to that, not even one company from the basic, first level of BMI capabilities, has obtained a strongly positive comparative yearly profitability, and not even one company from the top fourth level of BMI capabilities has obtained a strongly negative comparative yearly profitability.

Figure 3: BMI and SOP



As indicated in Figure 3:SOP and BMI capabilities are positively correlated. The higher the level of BMI capabilities, the higher the SOP and vice versa. The higher the level of SOP, the higher the BMI

capabilities. The lower the level of BMI capabilities, the lower the SOP. The lower the SOP, the loewer the BMI capabilities. Companies with stronger BMI capabilities are obtaining better profit growth than companies with low BMI capabilities. .

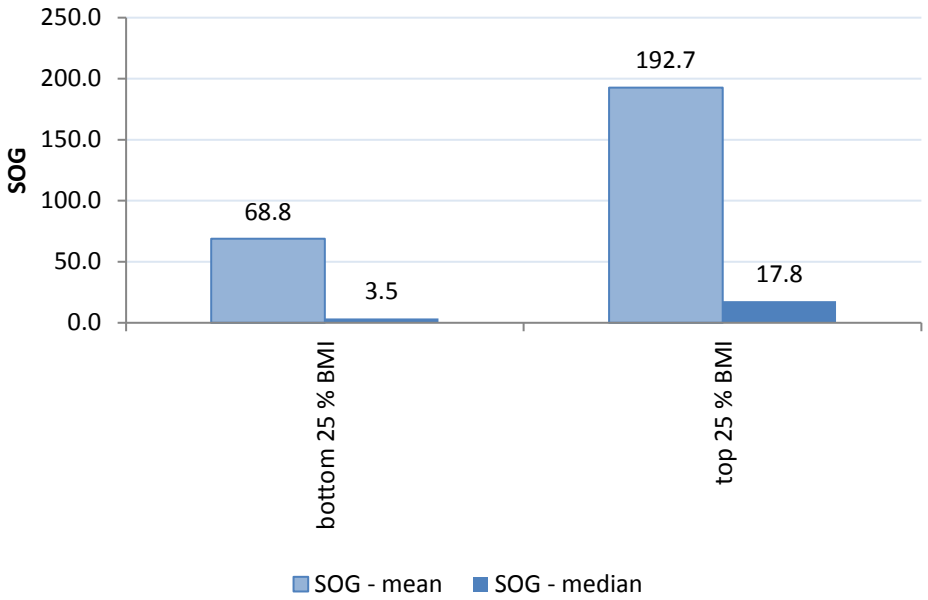
Having considered the relationship of BMI capabilities to company performance as expressed through SOG, SOMS and SOP, below we focus in on the bottom, worst performing 25% of companies in terms of BMI capabilities and the top, best performing 25% of companies in terms of BMI capabilities to additionally test the model without the large percentage of companies in the mid-range of BMI capabilities.

2.4. Top 25 vs. bottom 25 % of companies in terms of BMI capabilities

Given the relatively large group of companies that fit into the mid-range of BMI capabilities, to further test the results of the previous section, we here investigate the bottom and top performing 25% of companies in terms of BMI capabilities and the relationship with financial performance. Here again we look into the relationship between BMI capabilities and company performance over time with respect to sales growth rates (SOG), market share expansion (SOMS) and profitability (SOP).

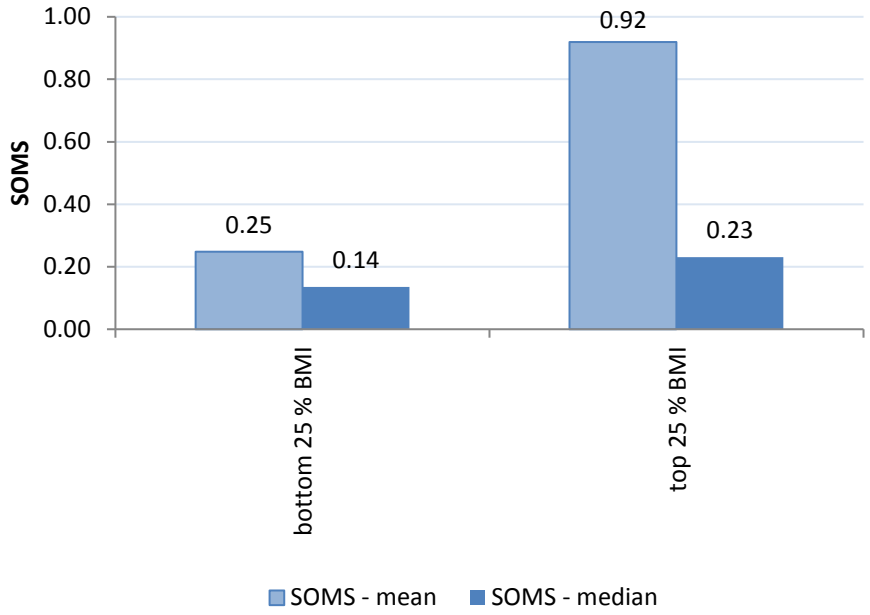
In order to compare the top and the bottom performing 25 % of companies in terms of BMI capabilities levels with the obtained SOG, SOMS and SOP levels, we used a non-parametrical Mann-Whitney's test. The top 25 %, companies with the highest developed BMI capabilities, are with statistical relevance, performing better than the rest of the companies in all of the three elements. The bottom 25%, those with the lowest BMI capabilities, is the lowest performing of the sample for all three performance measures.

Figure **Error! No text of specified style in document.**: Comparison of top vs lowest performing 25 % of companies in SOG



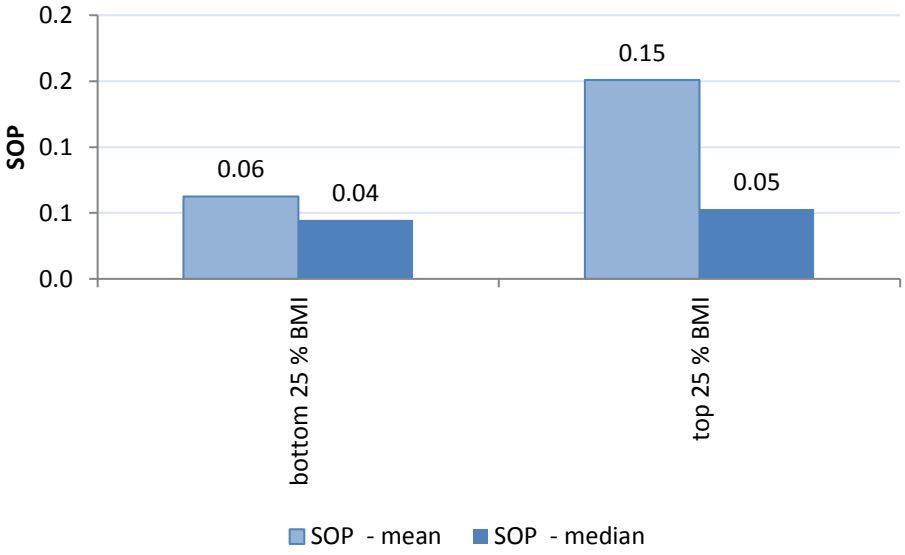
Similar to SOP, companies that classify within the 25 % best companies in terms of BMI capabilities have an almost three times higher value of SOG than the 25 % of companies with the lowest value of BMI capabilities. While not detected at SOP we here with SOG encounter a similar very high difference also in median. That is, in this case the differences in the average value of SOG between the two groups do not arise from only a handful of companies with a high value of SOG. They come from a vast majority of the companies with high BMI capabilities. The two groups differ very strongly in terms of SOG.

Figure 6: Comparison of top vs lowest performing 25 % of companies in SOMS



25 % of companies with the highest BMI capabilities have almost four times higher average value of SOMS and almost two times higher value of the SOMS median than the 25 % of companies with the lowest BMI capabilities. The two groups of companies differ very strongly in terms of SOMS.

Figure 4**:** BMI capabilities, top vs lowest performing 25 % of companies in SOP



Companies that classify within the 25 % best companies in terms of BMI capabilities have almost three times higher value of SOP than the 25 % of companies with the lowest value of SOP. Within these two groups of companies there is a much lower, though statistically significant difference in median, which shows that some of the companies with high BMI capabilities have a very high value of SOP, which is lifting the average SOP strongly.

We can thus clearly and confidently, while based on available only approximative data for SOG, SOMS and SOP and while only comparing longer term change over time with currently existing BMI capabilities, conclude that the amount of BMI capabilities in companies is importantly related with SOG, SOMS and SOP. Companies that have more developed BMI capabilities are more BMI capabilities mature, historically grow faster, gain market share faster, and increase profits faster than those with lower BMI capabilities.

The results indicate and statistically confirm that the level of BMI capabilities has a very strong relation with companies' performance. The higher the level of BMI capabilities, the higher is the level of SOG and vice versa. The higher the level of BMI capabilities, the higher is the level of SOMS, and vice versa. The same holds for the SOP. The higher the level of BMI capabilities, the higher is the SOP and vice versa.

Hypothesis 3	More advanced and mature business model innovation capabilities correlate with better financial performance of the companies, i.e. better developed business model innovation capabilities are one of the important attributes of better companies' financial performance, also positively correlated with the positions of leaders and co-leaders in the industry. **CONFIRMED**

Additionally, and from the other side of the coin, BMI capability levels maturity is a predictor of higher performing companies.

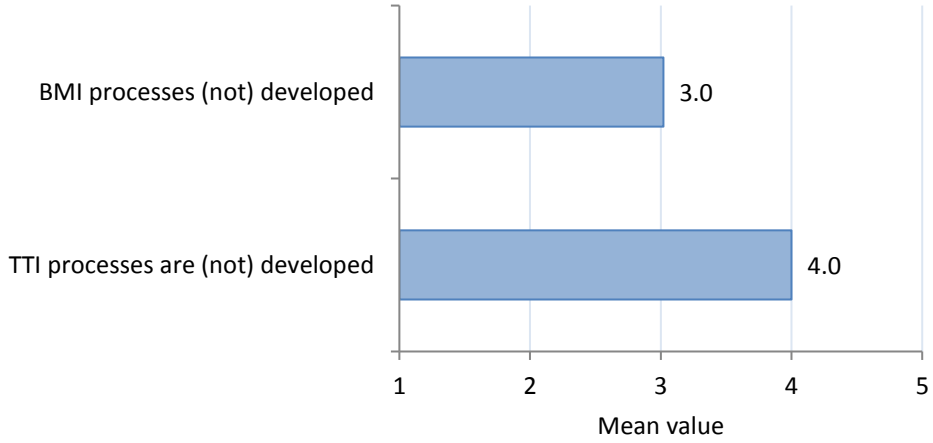
3. BMI & TTI

To this point we have considered BMI capabilities as separate from TTI capabilities. However, in the daily reality of companies, innovation activity tends to be intermixed and integrated. Separating BMI from TTI may limit many important relations between these two categories of innovation activity. Here we thus take a more detailed look at TTI capabilities, comparing them with BMI capabilities and the effects on company performance over time.

In order to detect the important nature of these relations, we shall be, based on the data as gathered by the survey, looking at an ensemble of the BMI and TTI capabilities impact on companies' performance. Our related hypothesis is that a majority of companies have more developed TTI capabilities than BMI capabilities.

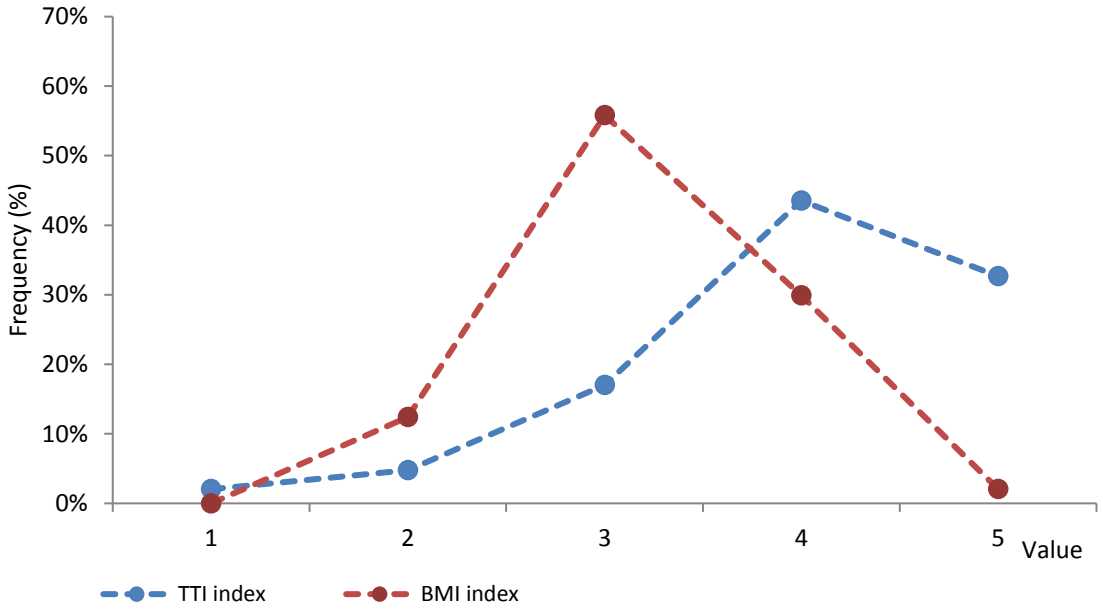
It is important to note here that the survey data gathered focused primarily upon BMI capabilities. Therefore, the data we are operationalizing to contextualize TTI is in our case based on the respondents' self-assessment of their relative levels of TTI, in comparison with TTI. As the result, respondents rated their companies higher on TTI (mean of 4.00) than BMI (mean of 3.02).

Figure 7: TTI vs BMI capabilities



Taking into consideration the five levels of capabilities maturity with respect to TTI and BMI, 32.3% of companies are placed on the upper two levels of BMI maturity and 76.2% of respondent companies place themselves on the upper two levels of TTI maturity.

Figure 8: TTI vs BMI capabilities per BMI capabilities level – frequency distribution



As shown in Figure 8, companies self-report themselves to be at much higher levels of TTI capabilities than BMI capabilities, i.e. they are more mature in their TTI activities than BMI activities.

This confirms our hypothesis that TTI capabilities are at higher levels than BMI capabilities. Put another way, companies focus more on TTI.

Hypothesis 5	Technical-technological innovation capabilities are more developed/mature than business model innovation capabilities.

This suggests a rather wide gap in the development of the two different types of innovation. While 33 % of the companies claim that they have reached the level of excellence in TTI capabilities (expressed by level 5), only 2 % of the companies claim to have done so at BMI capabilities.

Having shown the gap between TTI and BMI focus, we our hypothesis that companies with highly developed TTI capabilities and highly developed BMI capabilities will have the best performance in the industry - best performance not only measured by profitability level in the last four years, but by the position that the company has gained on the market over time and also measured by the relative indicators of SOG, SOMS and SOP. On the other hand, we expect that companies with the combination of low developed TTI and low developed BMI capabilities will have the worst performance in the sample.

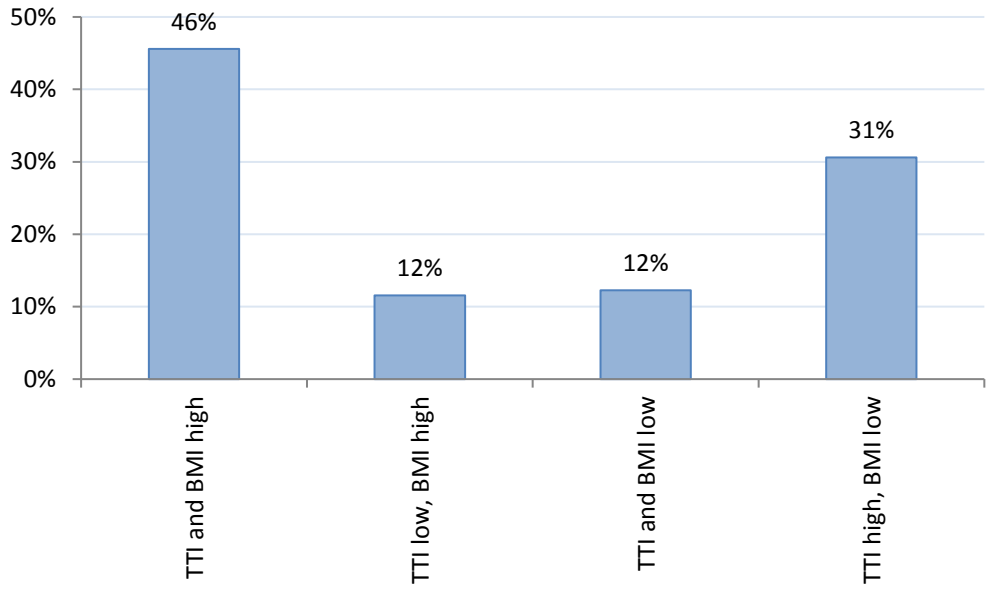
To explore these relationships we have constructed a combined BMI/TTI Capability Matrix. This combination allows us to compare and contrast the effects of BMI and TTI in relation to SOG, SOMS and SOP, with a view to identifying the most beneficial combinations as evaluated by company financial performance over time.

For the BMI/TTI Capability Matrix matrix we have followed the following breakdown of maturity levels to create a 2 x 2 comparison. Below are the relative levels delineated by the capabilities matrix levels chosen for high vs. low TTI and BMI:

- high BMI/high TTI (values of BMI and TTI capabilities index greater than 3 – above mean scale)
- low BMI/low TTI (values of BMI and TTI capabilities indexes including and below 3)
- high TTI and low BMI (TTI capabilities index greater than 3, BMI capabilities index including or below 3)
- high BMI/low TTI (BMI capabilities greater than 3, TTI capabilities index including 3 or below).

This combined index will serve us as the basis for categorizing companies in the four groups of the combined BMI/TTI capabilities indexes and as a basis for introducing the BMI/TTI Capabilities Matrix.

Figure 8: BMI/TTI groups of companies' frequency distribution



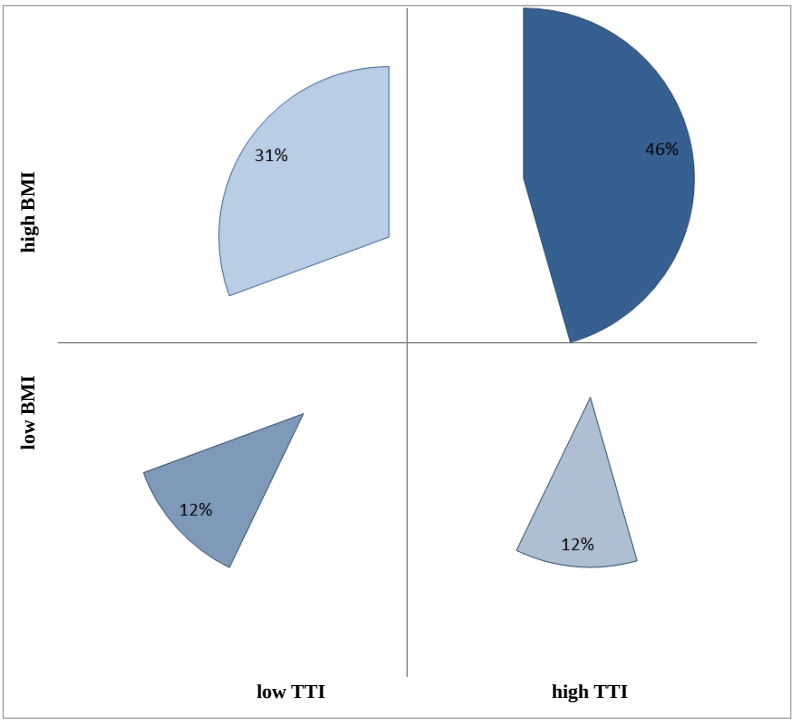
In terms of the distribution of the companies in the four groups of the BMI/TTI capabilities index, we have the majority of the companies, 46 % of all, in the high TTI and high BMI capabilities level. While that may seem as a contradiction to the earlier findings in terms of distribution of BMI capabilities, where we are confirming their Gaussial distribution and only a small number of companies with highly developed BMI capabilities, this result here is logically arising from the methodology of values of BMI and TTI capabilities that have been taken into consideration at splitting them in the four groups above. At dividing the companies in two groups in terms of BMI and TTI capabilities index (high and low values) we have used the mid of the scale, that is the value 3 as the limit between high and low capabilities. The BMI capabilities index has a normal distribution with the average of 3.2. As a consequence, according to such measure 57 % of companies classify in high BMI capabilities index values. On the other hand, TTI capabilities index does not have a normal distribution. As the distribution there is asymmetric to the left and with average of 4, at TTI capabilities index by using 3 as the limit, 76 % of companies are classified in high TTI capabilities index values. That is, the reason for having such distribution and 46 % of all companies in the high BMI/high TTI capabilities quadrant arises both from the normal BMI capabilities and from asymmetric TTI capabilities distribution.

In addition to that, a large number of companies in high BMI and high TTI capabilities according to that classification also reflect a high number of companies, simultaneously developing both BMI and TTI capabilities, which seems to be the prevailing pattern in the automotive industry.

On the othet hand, only 12 % of the companies have both low TTI and low BMI capabilities. It than seems logical and natural that 31 % of the companies are in transition from already having the traditionally high/higher TTI over having low BMI capabilities and are somehow in the transition from getting into the first group by also gradually adding BMI.

Drawing a special attention, there is an additional group of companies, accounting for 12%, that presents itself as a notable and highly interesting exception. This is the group of companies with low TTI and high BMI capabilities. Below we investigate this group more fully, with surprising results, as it brings into relief the relative astonishing value (in terms of performance adding results) of BMI with respect to TTI capabilities.

Figure 9: BMI/TTI Capabilities Matrix



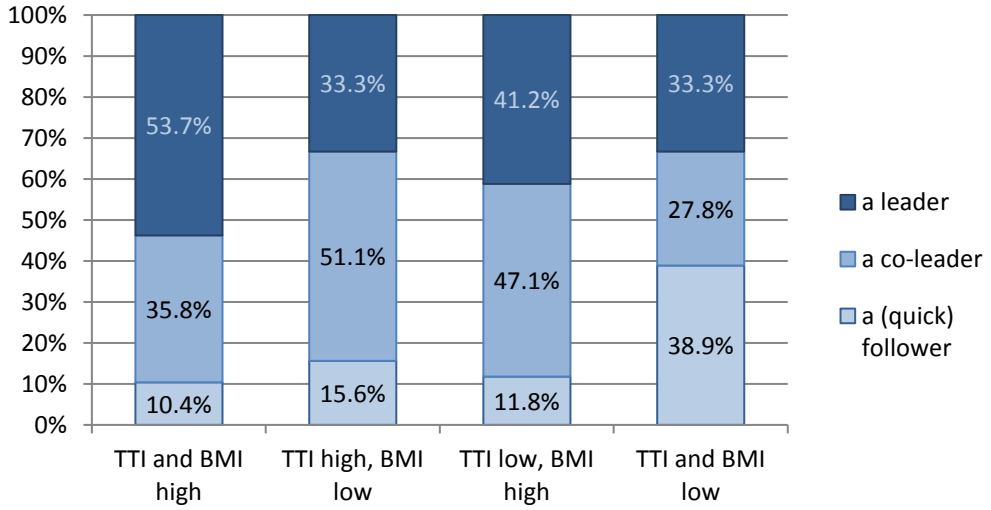
This distribution of responding companies across the four combinations of BMI and TTI capabilities will enable us to look into each one of these and focus on the value added of BMI vs TTI capabilities depending on these different combinations, as measured in terms of relative company performance.

We will now take a more detailed look at this interrelationship by first considering the relationships of the BMI/TTI Capability Matrix with perceived positions of leaders vs followers.

3.1. BMI & TTI capabilities, leaders vs followers

Having begun the process of considering the relationships between BMI and TTI capabilities in relation to company performance, in what follows we explore this by looking also at the related ratios in terms of leaders and followers. We are interested in understanding how the perception of managers in terms of their companies being leaders or followers relates to BMI and TTI capabilities.

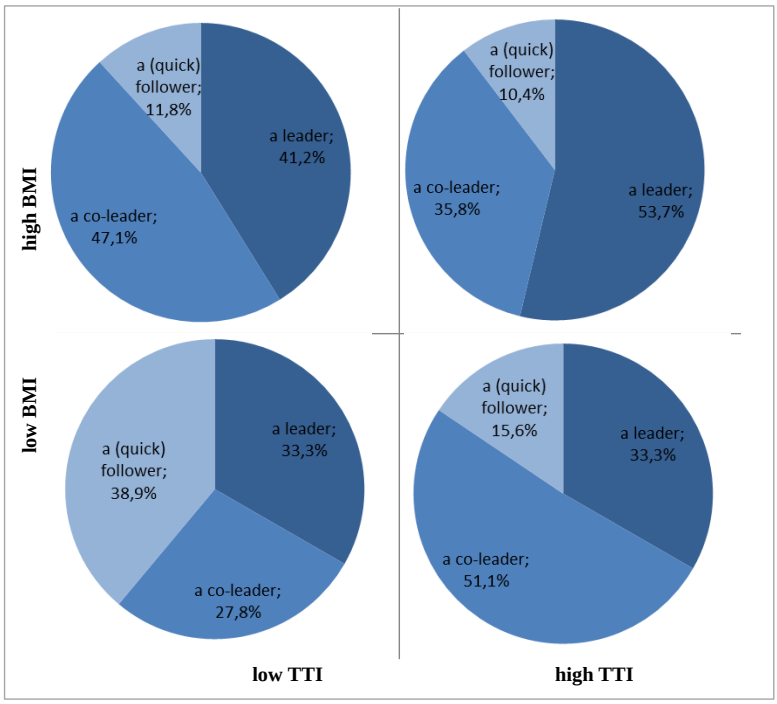
Figure 10: BMI/ TTI capabilities, leaders vs followers



In the high BMI/high TTI capabilities segment there is a much higher share of the companies which consider themselves as leaders (53.7 %), than in the group of high TTI and low BMI capabilities, where there are only 33 % of leaders. That level is actually comparable with the share of leaders in the low TTI and low BMI capabilities segment. That is, the move from low TTI and low BMI capabilities segment, where there are 33 % of leaders, to high TTI and low BMI capabilities segment does not result in any increase in the share of leaders. On the other hand, such a move to low TTI and high BMI capabilities segment, that is by adding high BMI capabilities to the existing low TTI capabilities, results in a significant increase from 33 to 41 % of those that perceive themselves as being in a leading position.

Based on Likelihood ratio (11.529) we can confirm that the correlation between perceived market position and position in BMI/TTI Capability Matrix is on the edge level of statistical significance (p=0.07).

Figure 11: BMI/TTI, capabilities leaders vs followers



The comparison of the BMI/TTI Capability Matrix positions of companies and positions of leaders vs. followers hints at another important fact. Low BMI and high TTI capabilities result in 84 % of those that consider their companies to be leaders or co-leaders. When we move to high TTI and high BMI capabilities (by adding to high TTI also high BMI capabilities) this increases to 90 % of those perceiving themselves as leaders or co-leaders. It seems that, all other conditions unchanged in respect to the two innovation capabilities or very comparable having the same high level of TTI capabilities), it is the BMI capabilities level that decisively impacts the notion of companies perceiving themselves (or not) as leaders.

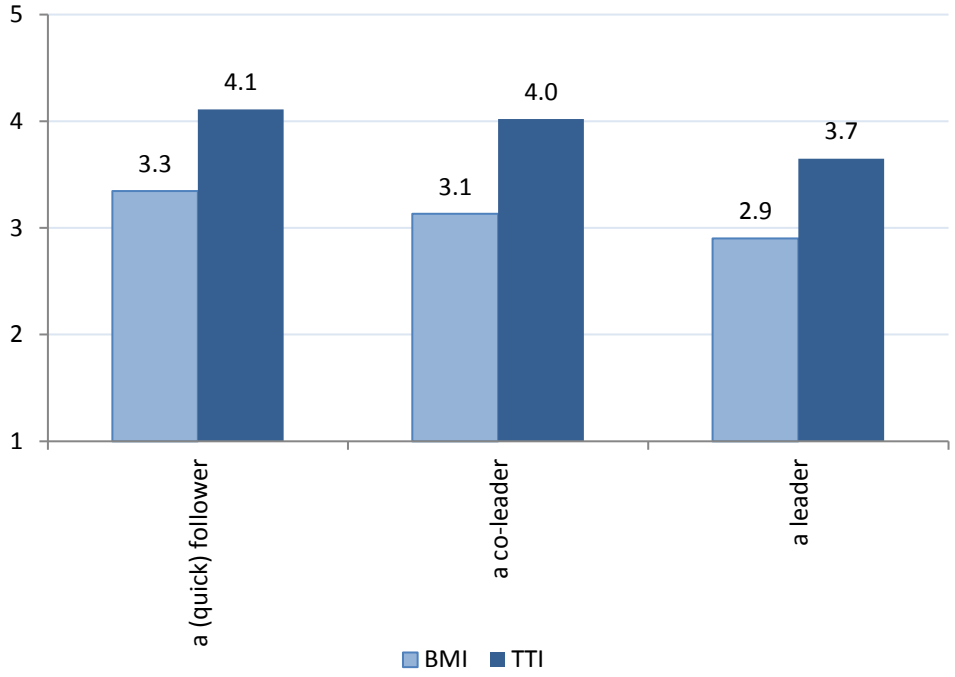
Furthermore, in measuring more in depth the other impacts of increase/decrease of one or the other type of innovation capabilities, it again seems that it is the BMI capabilities effect that is more important and that prevails in this relationship. Looking at the distribution of followers we have the largest share of the followers in the group of low BMI and TTI capabilities (38,9 %). On the other hand, this share of followers as before falls down sharply to only 11.8 %. by moving to high BMI with the same low TTI capabilities That is almost comparable with the level of followers (10.4 %) in the high BMI and TTI capabilities group. The share of followers is much higher (15.6 %) in the low BMI and high TTI capabilities group.

Put succinctly, having developed BMI capabilities significantly impacts the perception that one's company is in a leadership position. Moreover, there is an emerging correlation between developed BMI capabilities and market leading postions. We will thus further elaborate this important notion with respect to potential relationships of these BMI/TTI categories with company size and especially also performance.

Based on likelihood ratios, the relationship between market position and BMI/TTI Capabilities Matrix can also be confirmed, since p is larger than 0.05 ($p=0.07$), while again marking that the statistical significance is not strong.

Based on all of the above, we can claim that in the relationship between TTI and BMI capabilities, it is predominantly the BMI capabilities level that defines the perceived market position of companies, from the perspective of the companies themselves. We will therefore further check this important statement with the analysis of the averages of these two categories in comparison with the market position.

Figure 12: Mean values of BMI/TTI capabilities, leaders vs followers

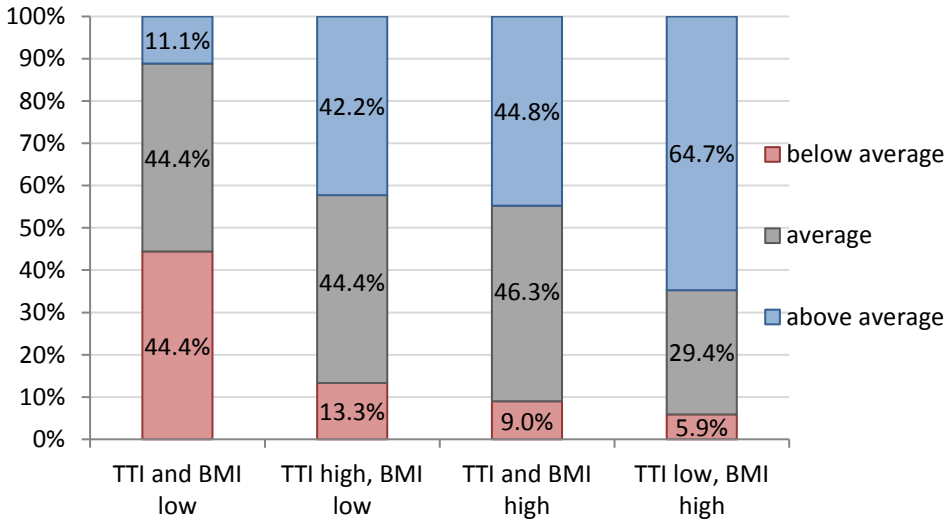


The average value of the BMI capabilities index is the highest in the group of leaders (mean =3.4), and the lowest in the group of followers (mean=2.9). The difference is statistically relevant (F=5.58, p=0.005). The average value of the TTI capabilities at the same time does not differ among the groups. It is therefore rather the BMI (and not TTI) capabilities and the BMI capabilities related issues/factors that basically influence much more how companies perceive themselves in terms of being leaders or followers.

3.2. BMI & TTI capabilities and financial performance

We are now highly interested in exploring the relationship between different positons within BMI/TTI Capability Matrix and financial performance of companies.

Figure 13: BMI/TTI capabilities and financial performance



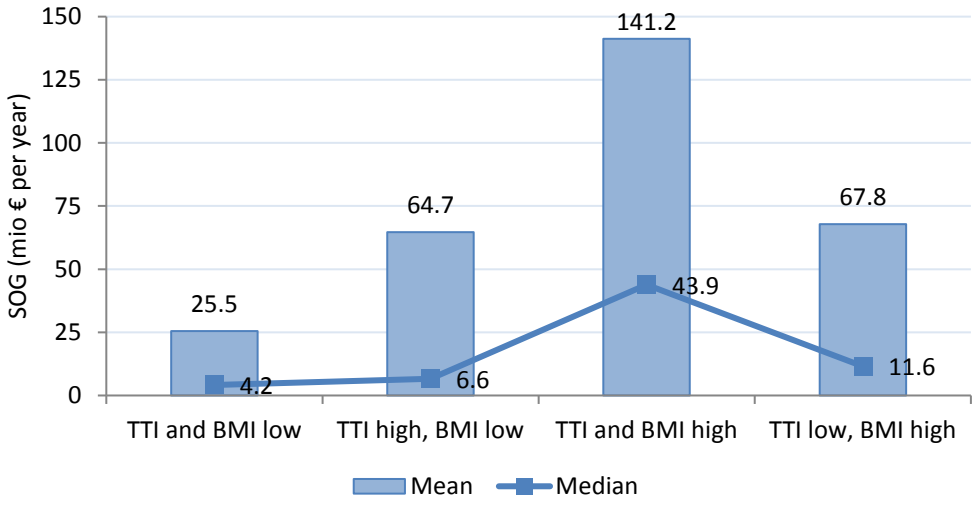
The largest share of below average financially performing companies comes as expected from the low TTI and low BMI capabilities segment. However, and importantly, the largest share of the above average financially performing companies does not come, as might be expected, from the high TTI and high BMI capabilities segment, but from the low TTI and high BMI capabilities segment. 64.7 %. A significant majority of companies reaching above average financial performance come from the low TTI and high BMI capabilities group. The group of high TTI and high BMI capabilities comparably provides 44.8 % of such companies in the structure. This is another important element, where a huge importance of BMI capabilities and even a specific type of its dominance in the relationship with TTI is again expressed.

This is a striking result and one of the key, somewhat counterintuitive outcomes of the study. While one would expect companies with high TTI and high BMI capabilities to be the best performing (as measured by financial performance), this is not the case here. The suggestion coming out of this analysis is that BMI capabilities alone have a higher impact on financial performance, in combination with some TTI capabilities. Put another way, in terms of financial performance BMI capabilities seem to provide more value than TTI capabilities. Below this is explored further with regards to SOG, SOMS and SOP data.

3.3. BMI & TTI capabilities and SOG

Exploring the result presented above, that BMI capabilities seem to have a greater impact on financial performance than TTI capabilities, we first interrogate this finding by looking at combined BMI and TTI capabilities segments with respect to the SOG of companies in the sample.

Figure 14: BMI/TTI Capability Matrix and SOG

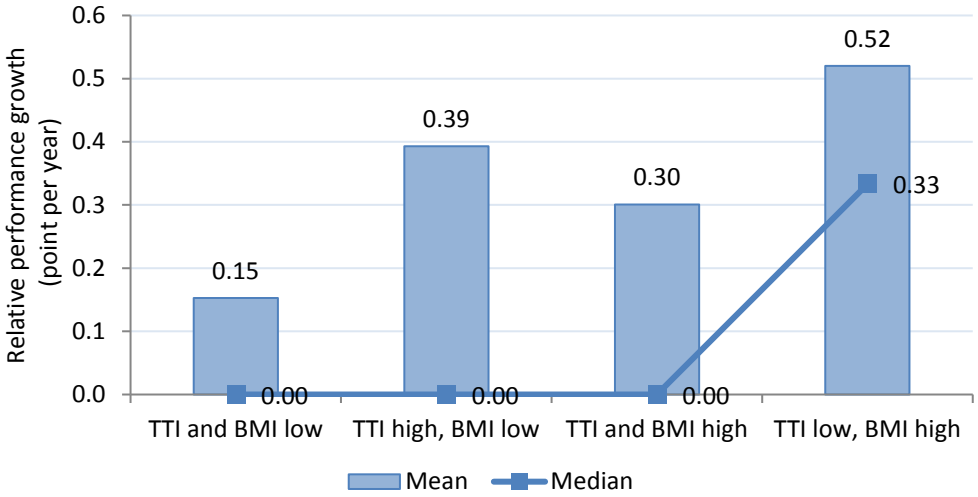


Companies with the combination of high TTI and high BMI capabilities have on average more than twice higher SOG than the companies with only one of the two types of innovation capabilities (TTI or BMI) being high and the other one low. Those companies with high TTI and high BMI capabilities have almost six times higher SOG than companies with both TTI and BMI capabilities being low.

Detailed insight in value of related medians shows that companies with high BMI and low TTI capabilities have twice as high SOG than companies with high TTI and low BMI capabilities. We can thus conclude that BMI capabilities have a much more important role in SOG than TTI capabilities.

In the following we analyze the relationship between BMI/TTI Capability Matrix and measures of relative performance.

Figure 15: BMI/TTI Capability Matrix and relative performance growth 2012/2009

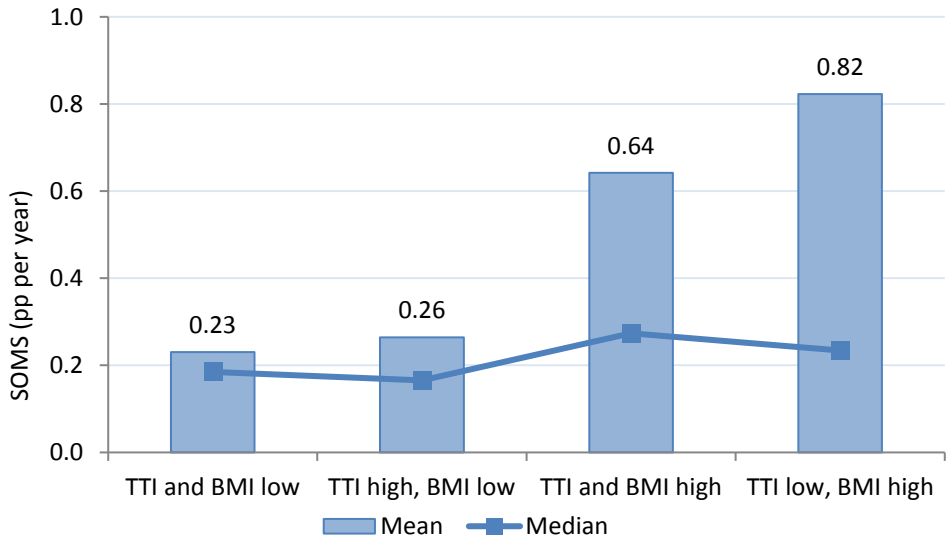


There is the highest value of SOG in the low TTI and high BMI capabilities, and the lowest in the low TTI and low BMI capabilities. Based on these results we can again conclude that BMI capabilities have an important role in terms of SOG, a more significant than TTI capabilities.

The highest performing companies in terms of SOG are those with high BMI and low TTI capabilities. This seemingly reconfirms the outcomes stated earlier on financial performance. Again, those showing the best performance, as measured now by SOG, are those with higher levels of BMI and lower levels of TTI.

3.3. BMI & TTI capabilities and SOMS

Figure 16: BMI/TTI Capability Matrix and SOMS



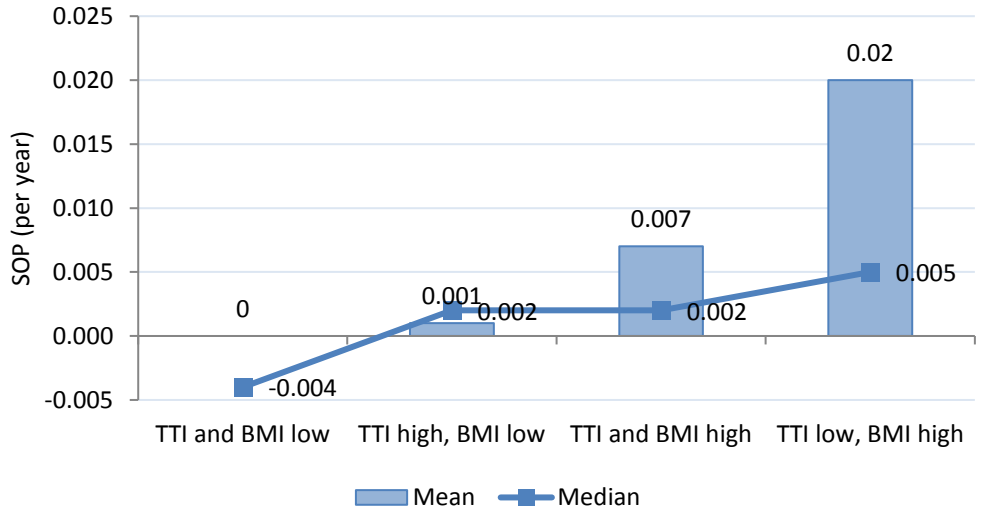
Again, the companies that have the best performance, as measured by SOMS, are not those with high BMI and high TTI, but those with high BMI and low TTI capabilities. On this measure, they far outperform the group with high BMI and high TTI capabilities.

Finally, we will have a look at this phenomenon from the lens of SOP.

3.4. BMI & TTI capabilities and SOP

As far as the relation between SOP and BMI/TTI Capabilities Matrix is concerned, we are here obtaining similar results and relations as also in the relation between SOG and SOMS and BMI/TTI Capabilities Matrix.

Figure 17: BMI/TTI and SOP



With respect to the relationship of BMI and TTI capabilities, companies with higher levels of BMI and lower levels of TTI capabilities clearly outperform all other combinations within the BMI Capability Matrix. The SOP is the highest in the groups with high BMI capabilities, independent of the level of TTI capabilities. In addition, SOP is the lowest in the case of low TTI and BMI capabilities, while it then increases in high TTI and low BMI capabilities and over high TTI and BMI capabilities, just as in the cases of SOG and SOMS. However, again and also in case of SOP, it reaches the highest value in the low TTI and high BMI capabilities segment. That is, we have the same behavior of SOP in the BMI/TTI Capabilities Matrix as also in the case of SOG and SOMS. This reconfirms our previous findings from sales and market shares growth and re-confirms a very close relationship between all of these measures of relative performance. BMI capabilities have a positive impact on all of these relative measures of performance, while TTI has a smaller or even negative impact.

Further, based on the findings so far and in order to cross-test them, we assume that different, i.e. four combinations between TTI and BMI capabilities, will result in a very different set of associated companies in terms of their market position and in terms of their SOG, SOMS and SOP. Below we consider this by including and testing these performance indicators across the BMI/TTI Capability Matrix.

We compare the BMI/TTI Capabilities Matrix with the market and financial characteristics of the companies as we have presented them in this section.

Figure 18: BMI/TTI Capabilities Matrix and overall companies' relative performance

	low TTI	high TTI
high BMI	average global footprint 70.6 % founded between 1940 and 1979 17.6 % with over 20.000 employees/ 47.1 % with 5.000 employees or more 41.1 % with yearly sales 1.000 € or more/ 100 % with yearly sales less than 5.000 mio € **64.7 % with forecast for EBITDA above average** median of SOMS 0.23 pp per year **median of SOG 67.8 mio € per year** **median of relative performance growth 09/12 0.33** 41.2 % leaders, 11.1 % followers	**highest global footprint** 64.2 % founded after 1940 **41.8 % with over 20.000 employees /** **58.2 % with 5.000 or more** **62.7 % with yearly sales 1.000 mio € or more** 44.8 % with forecast for EBITDA above average **median of SOMS 0.27 pp per year** median of SOG 43.9 mio € per year median of relative perfomance growth 09/12 0 **53.7 % leaders, 10.0 % followers**
low BMI	**lowest global footprint** 55.5 % founded before 1940, 5.6 % after 1979 **5.6 % with over 20.000 employees/** **44.4 % with less than 500** **16.7 % with yearly sales 1.000 mio or more** **11.1 % with forecast for EBITDA above average** median of SOMS 0.185 pp per year **median of SOG 4.15 mio € per year** median of relative performance growth 09/12 0 **33.3 % leaders, 38.9 % followers**	average global footprint 46.7 % founded after 1937 13.3 % with over 20.000 employees / 48.9 % with 500 - 4.999 employees 37.5 % with yearly sales 1.000 mio € or more 42.2 % with forecast for EBITDA above average **median of SOMS 0.16 pp per year** median of SOG 6.6 mio € per year median of relative perfomance growth 09/12 0 33.3 % leaders, 15.6 % followers

Bold blue	best result
Blue	2nd best result
Red	2nd worst result
Bold red	worst result
Grey	can not be evaluated

In the above TTI/BMI Capability Matrix, which provides insights into performance characteristics of companies falling into each of the four capability segments, companies present in the low TTI and low BMI capabilities quadrant have the smallest absolute size in terms of value of yearly sales as well as the smallest absolute size in terms of number of employees. They are followers and quick followers, which can in some cases have higher market shares, but with lower TTI and lower BMI capabilities they are underperforming in all other terms. They are the oldest companies, the majority of them being founded prior to 1940. They have the worst relative results. Their SOG as well as SOMS and SOP over time are the lowest among all companies. They have the lowest global footprint. In this group there is the largest share of the companies that see themselves as followers. Basically, we can describe them as smaller, usually only nationally and not globally based companies that have consciously

decided to follow and not to lead or have just not developed the abilities/capabilities required for leading, and are not seriously and systematically investing in either TTI or BMI capabilities.
Moving to the right on the bottom of the TTI/BMI Capability Matrix, companies start to differ in performance as they move from low TTI to high TTI capabilities, but still have no significant BMI capabilities. As companies increasingly invest in TTI capabilities and as they are entering in the high TTI and low BMI capabilities zone, the absolute size of the companies in terms of sales revenue per year as well as in terms of number of employees is growing, due to the higher SOG and SOMS.

Zeroing in on the group of companies in the bottom right quadrant (high TTI but low BMI capabilities) we find here industry leaders and co-leaders, with high TTI capabilities, high absolute market share, but lower absolute sales and lower SOG and SOMS. This is accompanied, and perhaps even explained by lower and less consistent levels of BMI. Looking at the leaders and co-leaders as one group (as opposed to quick followers and followers), the share of the leaders is substantially higher, i.e. the share of the quick followers is substantially smaller in this quadrant towards the previous one. The market share is larger, while the growth is still lower than in the high TTI and high BMI capabilities segment (the upper right one). This altogether clearly indicates that we have a group of technical specialists here, not having developed BMI capabilities at all or in a very limited amount. They are therefore excellent in a certain limited, relatively narrow niche, they have a high market share there, but with the smallest degree or literary no diversification, they have limited capabilities in terms of overall growth. Nevertheless, the SOP is consequently higher than in the low TTI and low BMI capabilities segment, but companies here are (with all the positive but also negative consequences) limited by the boundaries of the selected niche.

Based on the available data on the levels of overall absolute sales, levels of market shares and SOG, SOMS and SOP and their development in dependence on the different segments of TTI and BMI capabilities, it seems that a certain amount of diversification is good for SOG, SOMS and SOP versus just pure niche specialization. Leaders and co-leaders can thus many times be leaders/co-leaders "only" in specific narrow niches, with a relatively high market share, whereas the absolute sales can be on the level of some billion EUR, with good or very good results, but with relatively modest sales growth and relatively modest growth of market shares in comparison with leaders that seem to be reasonably diversified and have therefore grown much more in the same time frame. Leaders/co-leaders, focused on a specific narrow niche, usually have lower developed BMI capabilities. Many times the only or at least the most important difference, i.e. differentiation element, between both groups is actually better or worse developed BMI capabilities. In the case of highly developed TTI it is the well-developed BMI capabilities that considerably improve the performance. The case of low TTI and high BMI capabilities even results in the best performance of all of the cases.

Moving directly into the top-right segment, we here find companies that are combining high TTI capabilities with also high BMI capabilities. It seems that the extent of the diversification here is being kept on the level, where the variety of the businesses is still small enough for the companies to be able to keep the leading roles in them and obtain the related fast growing market shares and at the same time still big enough to enable overall significant higher absolute and relative growth. In most of these cases, such balanced wise diversification is reached by using BMI capabilities both within each of the specific businesses as well as accros them, by using the available synergies. We though get a typical wisely diversified transnational company, holding leading positions in its several wisely chosen core businesses on a global scale. SOP consequently also further grows. BMI significantly contribute to enlarging the scope of the business, while still staying within the viable limits of running the best performance in each of the industries involved.

Since the notion of diversification at this point is drawn only from the relationships between the market shares, absolute level of sales and SOG, it needs to be further specifically explored and re-checked in further research.

The third group of companies in the upper right quadrant of the BMI/TTI Capability Matrix is thus the group of leaders and co-leaders, with high market shares (typically over 20 %) and at the same time

high absolute sales and high SOG and SOMS, which are obtained because of high TTI and high (and consistent/balanced) BMI capabilities, which result in high performance and high growth.

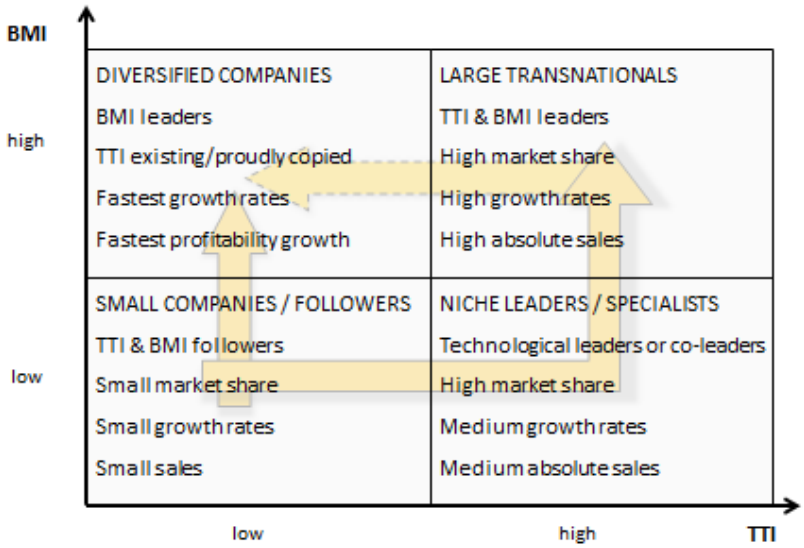
Companies can thus move from the low level of TTI and low level of BMI capabilities segment by investing in TTI capabilities and obtaining the high TTI and low BMI status first, or they may in addition or in parallel already also invest in BMI capabilities and thus position themselves in the high TTI and high BMI capabilities quadrant directly.

As seen from the resuls, there is that another direction possible as far as the growth of the innovation capabilities is concerned. Another direction, which has so far not yet been clearly identified and debated. This is the realm of companies that focus more upon BMI capabilities than they do upon TTI capabilities. As the results in the previous section indicated, this combination proved to provide the best overall performance of companies as measured by financial performance and consequently in terms of SOG, SOMS and SOP. As a matter of fact, companies which do not invest in TTI capabilities and/or keep them low, while they are substantially heavily investing in and developing BMI capabilities, and appear in the upper left quadrant of the BMI/TTI Capability Matrix, are creating a completely new, so far largely neglected successful, financially best performing business model.

Looking more into the characteristics of these companies, they prove to be younger companies that are growing their market shares as well as their sales the fastest and are therefore already reaching also significant absolute size both in terms of sales as well as in terms of the number of employees. Based on the analysis and sample involved here, this success emanates from the enhanced BMI capabilities of these companies. Having lower levels of TTI, and therefore reducing TTI resource costs which are typically high, these companies are either using the existing (their own or external) technical solutions from the past or are smartly getting a low cost access into TTI of others. They are focusing on leveraging proprietary technology or available technology developed by others, and integrating them with new business models. This strategy decreases heavily the otherwise huge investments required in TTI capabilities and shortens the long time to market and time to investment return and consequently provides also above average performance with the above average SOG, SOMS and SOP of these companies.

Figure 19 below simplifies the rather complex characteristics of companies presented in the above Figure 18:, identifying them, from bottom left counter-clockwise to top left, depending on the level of the TTI/BMI capabilities, as: small companies/followers, niche leaders/specialists, large transnationals and diversified companies.

Figure 19: BMI/TTI Innovation Matrix



To summarize these findings, leading companies in terms of SOG and SOP (i.e. companies with fastest profitability growth) are proving to be a type of companies that we can call BMI capabilities leaders. These are companies that intentionally put their focus on BMI capabilities, reducing a focus on in-company TTI capabilities. They are specialists in integrating existing or new technical-technological solutions developed by others, with their capacity to innovate on business models.

The arrow on the chart shows us the usual/natural direction of growing innovation capabilities and consequently performance/profitability of the companies. It reflects the traditional development of company's innovation capabilities from the lower left through lower right to upper right segment and finally to the upper left segment. In other words, from low TTI and low BMI capabilities, by adding also TTI capabilities over high TTI and low BMI capabilities, by adding also BMI capabilities over high TTI and high BMI capabilities to, finally, by now deducting, i.e. decreasing TTI capabilities, by "outsourcing" them, low TTI and high BMI capabilities. In this case, there is the usual/natural development, an "indirect" one, where companies either move to high BMI and low TTI capabilities in the previously described way, from high TTI and high BMI capabilities segment. They do that deliberately and by purpose/strategy, abandoning/decreasing TTI capabilities (which otherwise in most of the cases represent huge investments, cash-outs and increased fixed costs which burden a company's profitability). Or they can do that directly, by a direct move from the first segment.

To summarize to this point, it is in the low TTI and high BMI capabilities segment where the best performance is found. It is here that companies demonstrate the fastest growth and highest absolute sales. They have the highest SOM and SOMS. Moreover, they have the highest SOP and are more likely to be in market leader or co-leader positions.

The overall conclusion coming from this analysis is thus that highly developed BMI capabilities lead to a consistent and successful growth and market leading positions and above average profitability in the companies in the European automotive industry. That is, more than TTI, it is BMI capabilities that make the difference and contribute to the financial performance of the company.

Returning to our hypothesis that the best financially performing companies would be those with high levels of BMI capabilities combined with high levels of TTI capabilities, we find this hypothesis disconfirmed.

Hypothesis 6	The combination of highly developed/mature technical-technological innovation capabilities and of highly developed/mature business model innovation capabilities will result in the best companies' performance in terms of growth of market shares, sales growth and growth of profitability. **DISCONFIRMED** **It is the combination of low developed technical-technological innovation capabilities and of highly developed/mature business model innovation capabilities that results in the best companies' performance in terms of growth of market shares, sales growth and growth of profitability.**

Rather, the best financially performing companies within the sample – which is indicative of the overall European automotive industry – are those with high BMI capabilities and lower TTI capabilities.

As a final test of these results we will look at them in reverse, that is, we will depart from SOG and SOMS of companies in the sample to see whether it holds that those companies with the higher SOG and SOMS are also reporting higher BMI capabilities.

4. BMI/TTI CAPABILITIES MATRIX VS SOG AND SOMS

In this section of the analysis, we run one final test to investigate the finding that the highest financially performing companies are also those with the highest capabilities in BMI. To do this, we have combined indicators on SOG and SOMS with the reported levels of BMI capabilities: strategy, organizational, human resources, reward systems and processes. To group companies into high versus low segments the following criteria were applied:

Group 1: high SOG and high SOMS – the values of both factors are in the upper third of the obtained values

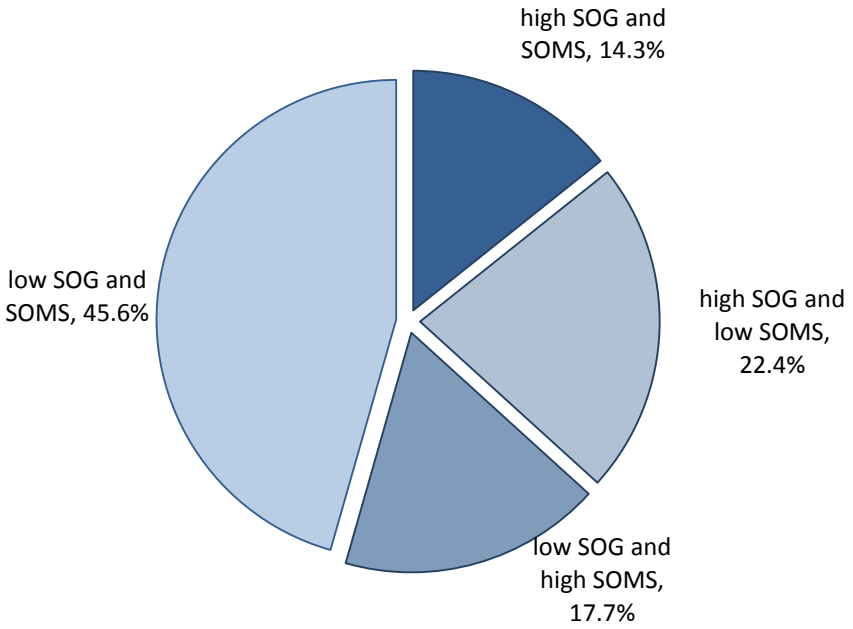
Group 2: high SOG and low SOMS - only the values of SOG are in the upper third

Group 3: low SOG and high SOMS – only the values of SOMS are in the upper third

Group 4: low SOG and low SOMS – the values of both factors are below the upper third of their values.

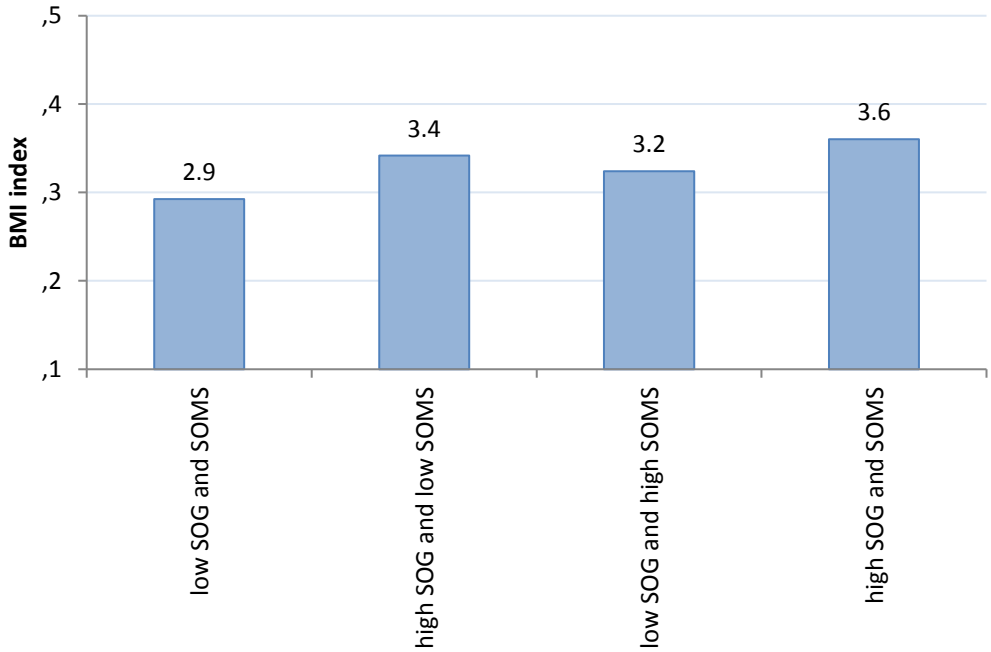
Only 14.3 % of the companies, representing the smallest group of all, fall into the high SOG and high SOMS share group. 17.7 %, the second smallest group, fall into the high SOMS, while having low SOG. They are growing their market shares, but do not grow the sales at such high rates. 22.4 % of the companies have high SOG, while having low SOMS. The majority, 45.6 % of the companies, fall into the lowest SOMS and SOG..

Figure 20: SOG/SOMS frequency distribution



Next we distribute these groups according to the reported BMI capabilities as identified in the previous sections.

Figure 21: SOG/SOMS positioning vs BMI capabilities



The low SOMS and low SOG segment has the lowest level of BMI capabilities. The high SOMS and low SOG, i.e. companies, being technical-technological specialists, have a bit higher BMI capabilities level, while still lower than the companies with low SOMS but high SOG. Moreover, this distribution again shows that the highest performing companies, those with the highest SOG and SOMS also have the highest median BMI capabilities.

Strikingly, the highest performers in terms of SOG and SOMS have the highest scores in terms of the BMI capability levels. This adds further confirmation and subtly to the finding that higher BMI capabilities yield higher results in performance over time.

This final confirmation of the findings related to the relationship between BMI capabilities and financial performance, along with all previous results and confirmed first five hypotheses and disconfirmed sixth, gives us sufficient ground to construct an embedded business model innovation (EBMI) Capability Framework.

5. CONCLUSIONS

Based purely on the short term financial performance in 2009-2012 and market share and current market position in 2012, there were only some partial statistically significant correlations present between how much a company had a developed BMI capability and that company's performance within that short time frame.

In order to understand more, we expanded the exploration to include change over longer time period. We have for that purspose developed: i) speed of growth (SOG) ii) speed of gaining market share (SOMS), and iii) speed of profitability (SOP). Though all of the relative measures of financial performance of companies are, due to the data available in the study, only approximative and though we are comparing existing, current level of BMI capabilities (and not measured in time and over time) versas financial performance over time, we can reasonably assume that BMI capabilities just can not be developed over night and this correlation, if existing, has an important significance and meaning. This enabled us to include a change over time perspective and provide new insights into the relationship of BMI capabilities and company financial performance.

We have confirmed that all of the three mesures of relative performance of the companies, SOG, SOMS and SOP are strongly positively corelated with the level of BMI capabilities. Those companies that have more developed BMI capabilities are more BMI capabilities mature, grow faster, gain market share faster, and increase profits faster than those with lower BMI capabilities.

We have shown that TTI capabilities are at higher levels than BMI capabilities and that companies focus more on TTI than on BMI.

We have constructed BMI/TTI Capabiliyt Matrix and have discovered that it is in the low TTI and high BMI capabilities segment where the best performance is found. It is there that companies demonstrate the fastest growth and highest absolute sales. They have the highest SOM and SOMS. Moreover, they have the highest SOP and are more likely to be in market leader or co-leader positions. Highly developed BMI capabilities lead to a consistent and successful growth and market leading positions and above average profitability. More than TTI, it is BMI capabilities that make the difference and contribute to the financial performance of the company.

In order to substantialize and re-confirm this claim, being clearly counter the current economic predominant wisdom, more studies are required, with very accurate data on SOG, SOMS and SOP on one hand and with providing exact relevant comparison in time between the development of financial performance and BMI capabilities.

Iztok Seljak, IEDC Bled School of Management

IN SEARCH OF EMBEDDED BUSINESS MODEL INNOVATION (4):

EBMI FRAMEWORK - RELEASING BMI AS A COMPETITIVE ADVANTAGE

Bled, March, 2015

ABSTRACT

Throughout history, from developments in society to the modern history of companies and corporations, the space of innovation has prioritised technical-technological innovation (TTI). The focus of this research and related four articles is different. It focuses on business model innovation (BMI). Through a quantitative survey approach to BMI in the European automotive industry, the research joins scholarly and practitioner conversations that are increasingly recognising, exploring and coming to more robust insights into the value derived from attending to innovation on the models upon which businesses operate, rather than the innovation of the products and services they offer. With conceptual and theoretical underpinnings from the resource-based view of the firm, BMI is here explored from the lense of dynamic capabilities and descriptive theories that have supported the development of capability maturity models. The results of this research speak to the value derived through BMI in conjunction with TTI as well as the value of BMI irrespective of TTI.

The traditional innovation gaze has been centred on the related structures, systems and processes for assuring a continual flow of TTI (those which have been held up as catalysts for major changes in society and organizations and consequently the sources of changing business models). This study, focused on BMI and its related BMI enabling capabilities and processes, investigates and describes how BMI exists not only to support, enable, realize and enrich, i.e. to "follow" and "escort" TTI, but is itself a set of resources and capabilities for generating new value. Moreover, BMI does not only play a supporting role but also leads, playing a solo role in efficiently integrating and upgrading existing and encouraging new TTI.

While research into BMI has been growing, there is still a dearth of empirical studies, particularly those taking a systemic look at organizational capabilities for BMI – what we referr to here as embedded business model innovation (EBMI). As such, the research presented provides significant empirically grounded, theoretically driven results that shed light on how companies approach BMI and the capabilities and processes they build to continuously do them.

The primary data for this study came from a quantitative survey approach involving high level informants from 145 companies in the European automotive industry. The study is centered on dynamic BMI capabilities in companies in the European automotive industry, exploring their relation to TTI capabilities. Furthermore, it develops a set of tools enabling companies to progress quickly towards systematic continual BMI and finally openly challenges the dominant wisdom focused on TTI. The data provides insights into how BMI, in comparison with TTI, may deliver better results both from revenue, market shares and financial viewpoints. The research provides a window into the current distribution of BMI capabilities in companies in European automotive industry and investigates the roles of strategy alongside organization, human resource structure, reward systems and processes. Ultimately the presence, maturity and relative alignment of such capabilities in companies in the European automotive industry is found to be core to the level of a company's BMI performance. In total, the findings focus on the relative "embeddedness" of BMI within companies and how this relates to company growth and performance over time.

To clearly structure, articulate and present these findings, a business model innovation/technical-technological innovation capability matrix (BMI/TTI Capability Matrix) is developed and the relations

between the two are explained. Complimentary to the matrix is a five-stage model of the relative maturity (embeddedness) of BMI capabilities within a company. This five-stage maturity framework (EBMI Capability Framework) of embedded BMI capabilities and processes (pre-phase, start-up, strategic commitment, pre-integration, integration) provides fresh insights, both theoretically and practically, in the space of innovating through business models.

The BMI/TTI Capability Matrix and EBMI Capability Framework integrate theoretical insights around BMI, dynamic capabilities and descriptive theories supporting the development of capability maturity models, bringing into relief empirically studied relations between BMI and TTI. They each separately and both together represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, embedded, systematic, continuous BMI and an important tool for practitioners to adapt their companies to the ever faster changing environments and to proactively provoke productive changes within them. Moreover, the results challenge the dominant logic that the combination and cross-link/cross-integration of TTI and BMI is the best option for achieving superior company growth and performance. The results indicate that a focus solely on innovating business models may yield the highest enhancement of growth and performance.

In the previous three articles, which are each separately and altogether seting the scene for the introduction of EBMI Capability Framework, we have developed theoretical foundations for the research and presented the applied methodology. We have presented the results in terms of BMI capabilities distribution and their visualisation. We have explained the relations between BMI capabilities and financial performance and BMI and TTI and have developed and presented the BMI/TTI Capability Matrix.

In this article, EBMI Capability Framework is developed and presented in details.

1. FOUNDATIONS OF EBMI CAPABILITY FRAMEWORK

In the preceding articles we have identified the core BMI related capabilities and have confirmed that dynamic capabilities for innovating business models in the companies in moderately growing industries tend to have a rather uneven intra-industry distribution, i.e. they tend to vary and differ substantially among the companies in the industry.

The results of the study indicate that a smaller part of the companies still has no institutionalized/organized capabilities for innovating business models, a majority of the companies already have at least some and yet a very small number of companies have established advanced and fully integrated functional BMI capabilities.

We have seen that more advanced and mature BMI capabilities and processes tend to correlate with better performance of the companies as expressed by SOG, SOMS and SOP, taken into consideration, that SOG, SOMS and SOP are constructed from very rough indicative data and the mentioned correlation needs to be further explored. Based on these data, better developed BMI capabilities appear to be one of the important attributes of better companies' financial performance, also positively correlated with company’s perception of being in leading or co-leading positions within the industry.

The data and analysis of this research has shown that maturity of strategy and overall strategic innovation capabilities, while important and a pre-condition for BMI, should be balanced with hard, operative implementation capabilities, such as organization, human resource and reward systems.

We have, based on these results confirmed that companies tend to have much more developed and mature TTI capabilities than BMI capabilities and processes. Based on the companies' self-evaluations, there seems to be, as expected, still a large gap between the presence of TTI and BMI capabilities in the companies studied here.

Against our expectations, it seems not to be the combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities that resulst in the best performance over time. According to the results outlined above, taking into account performance over time as expressed by SOG, SOMS and SOP, what appears to be the highest yield combination is a lower level of TTI capabilities and high levels of BMI capabilities. This is derived from the BMI/TTI Capabilities Matrix, explaining the relations between TTI and BMI capabilities in terms of financial performance.

Nevertheless, our data, due to the nature of the study and available data, show correlation and not causation. Therefor all of the mentioned findings and those to still follow, are so far of a non normative nature and further research is needed, comparing these findings with existing analytical frameworks and not just a testing of the model developed. Concrete directions for requiered further research are indicated in Conclusions.

Deriving from the life-cycles of TTI capabilities, based on capability maturity model theories, and based on the described current distribution of BMI capabilities among the companies, which are among others also showing similar pattern of their development over time, we can now draw a relevant parallel to the notion of the maturity life-cycles of BMI capabilities.

In the remainder of this article, we bring all of these discovered insights together under a framework for considering Embedded Business Model Innovation (EBMI). The concept of EBMI Capability Framework is an attempt to develop a maturity framework, identifying and enabling the development of core BMI capabilities in time.

We draw from the data and show how different companies tend to find themselves at different levels, i.e. maturity stages of integration – or embededness – progressing towards an embedded capacity to do BMI. Dynamic capabilities for innovating business models in the companies in moderately growing industries tend to have a rather uneven intra-industry distribution, i.e. they tend to vary and differ substantially among the companies in the industry. A smaller part of the companies still appears to have no institutionalized/organized capabilities for innovating business models, a majority of the companies appears to have at least some and a very small number of companies, again, appears to have established advanced functional BMI capabilities.

The EBMI Capability Framework, deriving from these insights, aims at describing an evolutionary development from ad hoc, inconsistently performed BMI practices, to a mature, systematic and continuously improving development of the business model related strategy, structure, human resource and results/reward systems and processes capabilities, which altogether should result in higher value added for customers, competitive advantage and finally better results for the company. Such an EBMI Capability Framework should help companies detect their current stage of their BMI capabilities maturity, should provide guidance to companies for available improvement actions and should help them integrate BMI with TTI and become a leading company in achieving continual BMI.

Prior to departing with the description of EBMI Capability Framework, the Frameowrk is strongly supported by the detected frequency distribution of the companies within our sample from European automotive industry:

Table 1: EBMI MTURITY Levels – frequency distribution

	Frequency	Percent
Level 1	10	6.8
Level 2	63	42.9
Level 3	45	30.6
Level 4	20	13.6
Level 5	9	6.1
Total	147	100

In the following we will describe the core characteristics of each of the five levels of EBMI Capability Framework.

2. EBMI FRAMEWORK – MATURITY LEVELS

2.1. Level 1, Pre-phase

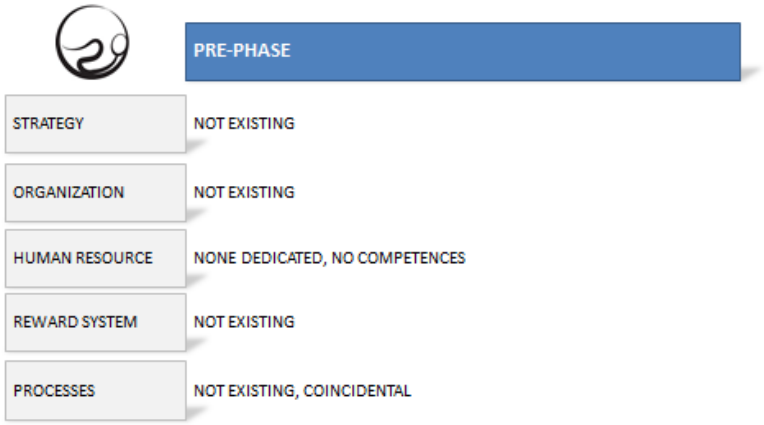
In reality only a remaining small number of companies in the sample (10 companies, i.e. 6.8 %) fall into basic Level 1, i.e. into the group of companies that are not at all developed in BMI capabilities.

As shown in the analyses of the BMI capabilities distribution, BMI Level 1 companies do not have a defined BMI capabilities strategy and there is no interconnection of BMI with TTI. They do not follow their competitors' business models and do not involve their customers and/or suppliers in their BMI efforts. They do not involve other external resources in their BMI efforts. They do not have anybody in the company that, fully or partly, deals with BMI. Managers do not consider BMI as a part of their regular work. They do not consider BMI as a part of the regular work of their team members. Employees are not encouraged to get involved in BMI efforts. These companies are not running any education on BMI. They do not have a recognition scheme related to BMI. They do not have a financial compensation scheme, related to BMI.

As every company, also EBMI Level 1 companies operate according to a certain business model; however, this business model is not specifically articulated. While companies might have heard about the debate about business models and their innovation, they have so far not felt the need or opportunity to associate it to their own company. In some cases, there may already be some discussion going on in the company about business models and BMI, but the required serious attention of any kind to BMI has not yet arisen. It may well be that in a long enough period of time only some sporadic changes in their business model have occurred, mainly as the result of encountering and fixing certain specific business problems, which has not been internally identified as business model change or BMI.

Overall, there is no leadership support for BMI and companies are exposed to potential business model changes in the industry with little chance that they would be able to survive in case of major business model changes or competitors introducing a continual BMI process.

Figure1: EBMI, Pre-Phase



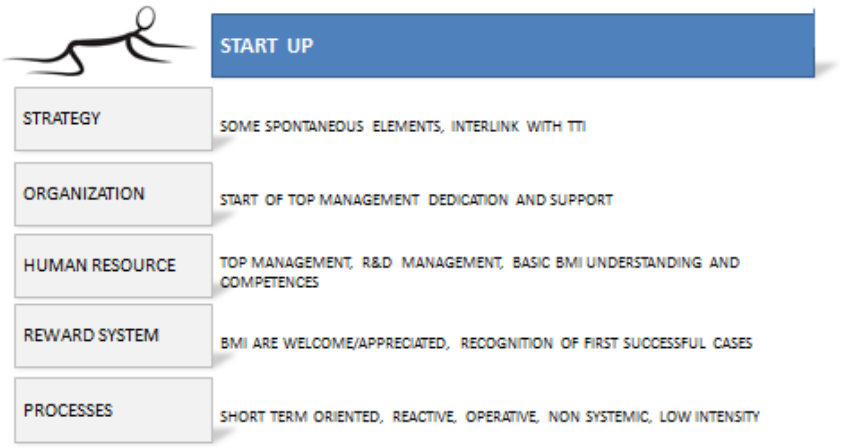
2.1. Level 2, Start-up

According to Table 1 and Figure1, 63 companies, i.e. 42.9 %, a vast majority of companies, are classified in EBMI Level 2.

In Level 2, the notion and concept of business model and BMI innovation is becoming more and more frequently mentioned and addressed within the company. Additionally, top management gets involved in this debate and is encouraging it. The basic awareness exists that the company is operating according to a certain "business model". The company starts being aware of the fact that certain changes have been sporadically made to its business model in the history of the company and that these have resulted in the company surviving certain challenging situations or even gaining a competitive advantage over a certain period of time, and that certain changes will also have to be applied in the future.

The company starts to articulate and map its own business model. The successful cases of innovating business models from outside, either from the most successful companies in the industry or wider, are being presented and discussed. As a result of this process, the company may sporadically, but for the first time consciously start discussing the first innovations in its own business model, usually as a response to certain concrete business threats or even opportunities. The first successful implementations of innovative business model changes are executed and the positive results are widely shared within the company and are encouraging further innovation in business models. Thus, innovation in business models is becoming a consistent part of overall innovation in the company and is starting to gain its place and their right besides product and overall TTI, while the relationship among them is not yet clearly defined. The first signs of the need for values and culture to also encompass BMI as an important part of overall innovation processes start to arise.

Figure 2: EBMI, Start-Up



2.3. Level 3, Strategic Commitment

As presented in Table 1 and Figure 2, 45 companies, that is 30.6 %, are classified as Level 3 of the EBMI Capabilities Framework.

In EBMI Level 3, top management has realized the potential of innovative business models and based on some successful implemented cases in the company is eager to have more innovation in business models as an important source of competitive advantage.

In order to provide for that, a specific explicit commitment of some kind is made to develop and nourish innovation in business models as a source of competitive advantage and therefore increased value added for the company. A certain kind of BMI vision and strategy is being defined. Employees are being encouraged to provide ideas and suggestions for innovating the company's business model. In order to make this process more successful, education on innovating business models is provided, either covered by internal or combined with external sources of knowledge.

Based on that, an organization as a whole is starting to get an idea of what a business model is and what it does. It starts to understand clearly the characteristics of their own business model and of how the company came to that business model. Past business model changes are being described and mapped and further learning is done on that. The number of innovations in business models in the company is growing; the number of ideas and suggestions of business models also starts to grow. They are widely presented and supported in the company.

Some kind of a reward system, directly connected to BMI, starts to appear. BMI starts to be measured and also rewarded in a different manner. There could be a specific reward for the best BMI, there could already be a concrete compensation scheme in terms of a share on result, provided by a change in the business model, or there could be certain compensation for providing valuable ideas for BMI. Successfully introduced innovation in business models is already making a concrete difference to the overall results of the company and bottom line is being improved due to BMI. Innovation in business models is but still sporadic, random, it comes rom individuals and teams, mainly from corporate and business unit management, which understands the notion and opportunities and feels inspired to contribute.

Figure.3: EBMI, Strategic Commitment

2.4. Level 4, Pre-Integration

According to data presented in Table 1 and Figure.3, 20 companies, that is 13.6 % of all companies, have been classified as Level 4 of the EBMI Capability Framework.

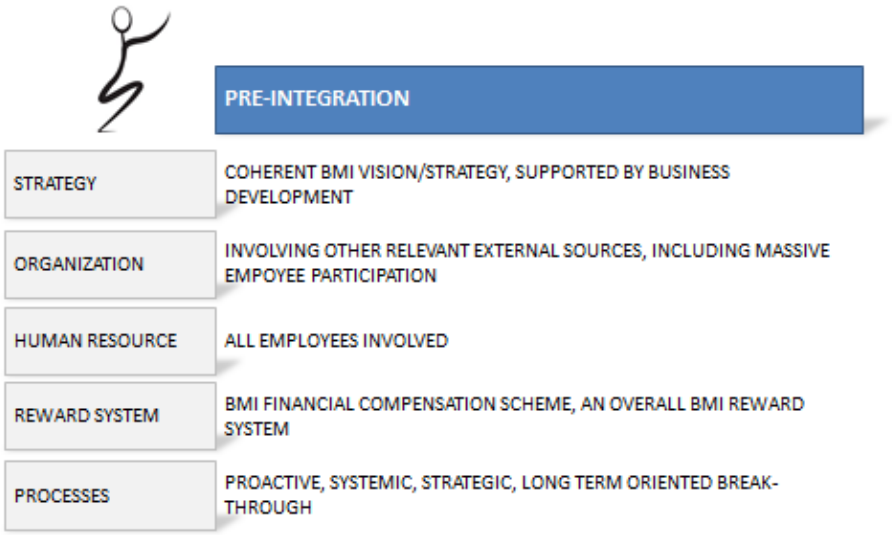
In EBMI Level 4 the company starts to feel the need to be even more active in BMI, to provide even more of it in order to create important competitive advantage through BMI. Random and sporadic ideas and implementations, as valuable as they are, are not sufficient any more. With the aim of assuring a continual stream of innovation in business models, the company starts to think about putting an according organization and processes in place. An executive, such as a Chief Innovation Officer, CIO, or potentially an R&D or Business Development Manager has been put in charge of BMI. Perhaps in the best cases one individual would be identified as Chief Business Model Innovation Officer.

Based on the lead from the top, BMI turns into a regularly run process, as the innovation in products and technology has been run for decades. At this point, BMI starts to systematically support not only the existing, but also future TTI in an organized pro-active manner. Corporate management and business unit management teams as well as different cross-functional teams meet regularly to discuss the potentials of BMI and to provide a stream of relevant ideas.

The company, besides mapping its business models, starts to map the business models of their competitors and regularly follow them. There may be specific rooms, offices and premises available for conducting the BMI process in a specific motivating environment. They are usually shared with those designed for product and technology innovation, but could also be separate.

Innovation in business models is regularly rewarded within the overall reward system of the company. Innovation in business models becomes a result of a well-defined system. The company consequently starts getting a continual stream of ideas, mainly from top and middle management, which are systematically evaluated and confirmed or rejected for implementation. BMI starts to make its way into overall business development plan of the company, and BMI becomes a consistent part of overall company's strategic planning.

Figure 4: EBMI, Pre-Integration



2.5. Level 5, Integration

As per Table 1 and Figur, 9 companies, which is 6.1 % of all companies studied, are classified as Level 5 of the EBMI Capability Framework. Level 5 presents the highest stage of the EBMI Capability Framework, i.e. presents the EBMI itself as such.

As a result of all cumulated experience, in Level 5 BMI becomes an integrated, embedded part of overall innovation efforts. BMI strategy is in place, business development process integrates both TTI and BMI – both TTI as well as BMI are embedded. TTI is combined from scratch with the search for the best possible innovations in business model, in order to assure the successful implementation of such TTI. BMI per se, as independent innovation, is being addressed.

The management fully supports BMI. Companies follow the development of their BMI projects. BMI proposals and ideas are being systematically gathered, analyzed and selected and the best go into implementation. Besides mapping its own business model development and the business model development of competitors, also the mapping of business models of other industries' business models is being provided, to learn from different realities and apply relevant findings to the company. A business model road map is being created and the specific projects are being shared not only with customers, but also suppliers, universities, independent research organizations as well as with open business communities, to involve them in common search for better and more efficient business models.

BMI ideas are being intensively systematically searched for outside of the company. Specific IT, specific software designed tools are being developed for enabling an overview as well as efficient information sharing among everyone involved in BMI within the company as well as externally. Some kind of BMI protection tools are put in place and exercised as a regular part of the process. New business models are being successfully implemented and the change in the business model is becoming as regular as the change into the next generation of product or technology.

Level 5 companies have defined people in the organization that fully or partly deal with BMI. Managers in these companies consider BMI as a part of their work. They consider BMI as a part of the regular work of their team members. Employees are encouraged to get involved in BMI efforts. These companies are running a structured well developed education on BMI.

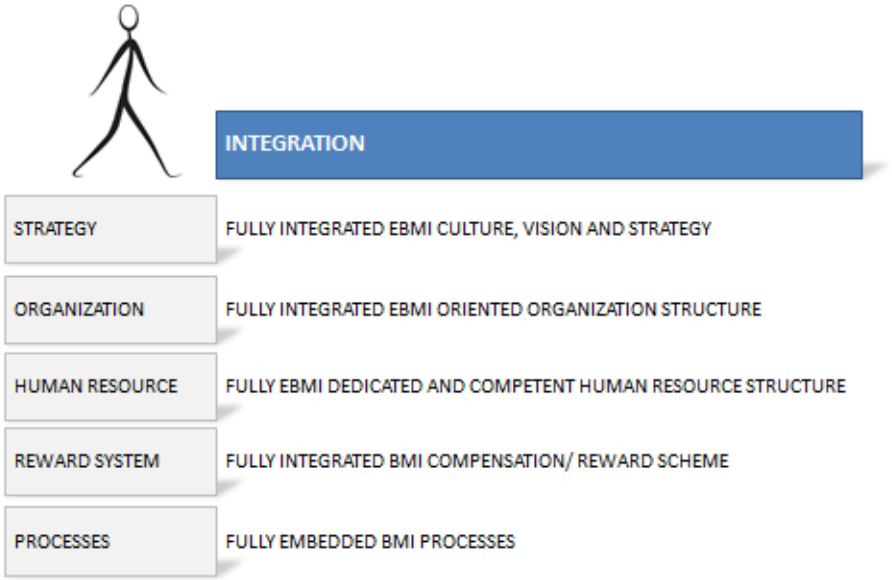
BMI is generally highly welcome in the company. Successful BMI is regularly presented and set as an example of good practice. These companies have a recognition scheme, related to BMI, as well as a financial compensation scheme, related to BMI. A BMI compensation scheme is a part of an overall reward system. Benefits of such innovation in business models are widely shared, not only with direct or indirect contributors, but also the wider community, i.e. numerous stakeholders of the company.

The company develops a fully integrated BMI culture and is getting a continual stream of valuable BMI ideas from the wide base of employees. It is efficiently implementing them by using BMI related processes, which are embedded, they have high intensity and high proactivity and they balance break-through and upgrade innovation as well as are oriented both short as well as long term.

Level 5 companies at least partially, and with an increasing trend, also start applying BMI "per se", that is independent of the proprietary TTI and based on the innovatiove products/services, i.e. solutions developed outside of the company, being in some way available to be used by the company.

Level 5 companies are consequently enjoying a preferred leadership position in the industry.

Figure 4: EBMI, Integration



While creating the EBMI Capabilities Framework for very practical use, we are all aware that we may rarely find an organization that ideally fits the framework in all of the details of its description according to each of the capabilities in each of the stages. Some capabilities might fit the overall level of a company's BMI capabilities maturity, some may be underdeveloped and some overdeveloped as the process of development of different BMI capabilities can find itself in numerous endless combinations on an infinite number of levels.

A "CVT" solution - alias Continuous Variable Transmission in the vehicle, which smoothly changes between endless possible combinations of driving – is thus fully captured and integrated in the fifth stage of our EBMI Capabilities Framework. It consists of adaptable dynamic BMI capabilities for shifting smoothly between different business models, as required by dynamic changes in the economic environment or as required to provoke these changes, avoiding negative turbulence for assuring

maximum performance for exceeding customers' expectations and providing them with delight, for creating new opportunities with literally no competition and for consequently creating an overwhelming shareholder and stakeholder value.

Figure **Error! No text of specified style in document.**.: Old vs New BMI System

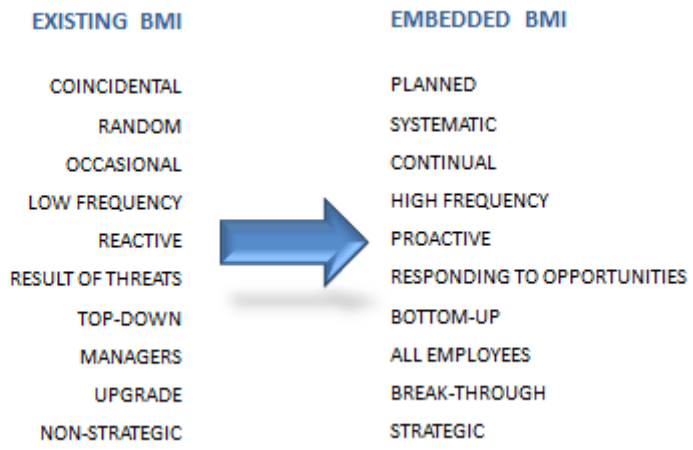
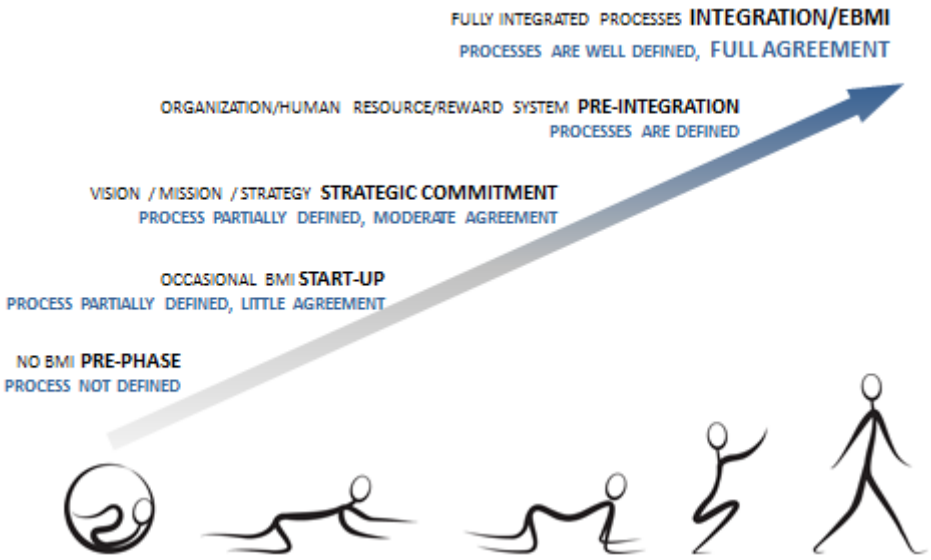


Figure.5: EBMI Capabilities Framework



The EBMI Capability Framework consists of five stages of maturity, each one being a platform for further improvement of the BMI capabilities, starting with the first phase, a pre-phase, where BMI is of no strategic importance to the organization, over start-up, strategic commitment and pre-integration phase to the fifth, integration phase, where embedded BMI capabilities appear as an integral fully embedded part of a wider business development process**.**

3. CONCLUSIONS

Throughout history the space of innovation has prioritised TTI. In contrast, and in response to a growing body of academic and practitioner attention, this study has focused upon BMI. In particular it has explored and described how BMI itself, independent of TTI, tends to be a powerful resource and capability for generating new value. The research presented provides significant empirically grounded,

theoretically driven results which shed light on how companies approach BMI and introduces an EBMI Capability Framework as a tool for assessing and developing BMI capabilities, with a goal of developing embedded BMI capabilities.

The literature review highlighted calls for more empirical research into how companies display capabilities in BMI, especially into those that excel at continually dynamically changing the very way they function through adapting to ever increasing speed of external changes and through provoking and creating these changes themselves. The literature expresses the need to investigate not only the occasional inspiration of individuals and teams, but a systematic consideration of how these can become systemic, proactive and react to the opportunities, and thus become continuous. It is this gap, this dearth of empirical studies into the "what and how" companies are doing in BMI, that I targeted in this research. To do this I focused on the "what and how" of a moderately dynamic industry, the European automotive industry.

The literature implicitly and explicitly suggests that the companies differ significantly in terms of their capabilities for BMI, without identifying them clearly. It led us to detecting the basic BMI capabilities and a hypothesis that dynamic capabilities for innovating business models in the companies in moderately growing industries have a rather uneven intra-industry distribution, i.e. they vary and differ substantially among the companies in the industry and that they have a normal Gaussian distribution. Moreover, the literature strongly suggests, while not delivering empirical verification, that more advanced BMI capabilities correlate with better financial performance of the companies, which we have therefore examined as well.

The literature further assumes that strategy and overall strategic capabilities, while important and pre-condition for successful BMI, need to be balanced with hard, operative implementation capabilities, such as organization, human resource and reward system role and impact, which we are accordingly verifying with the survey.

TTI capabilities are according to the literature more developed/mature than BMI capabilities. The combination of highly developed/mature TTI capabilities and of highly developed/mature BMI capabilities is supposed to result in the best financial performance.

Based on the study results, Hypothesis 1, that dynamic capabilities for innovating business models in the companies in moderately growing industries tend to have a rather uneven intra-industry distribution, i.e. they tend to vary and differ substantially among the companies in the industry, was confirmed.

As per Hypothesis 2, based on our sample analysis we have confirmed that a smaller part of the companies still tends to have no institutionalized/organized processes for innovating business models, a vast majority of the companies tend to have at least some and a very small number of companies tend to have established advanced and fully integrated functional BMI capabilities. BMI capabilities currently have a typical Gaussian distribution. 7 % of companies classify in EBMI Level 1, 43 % of the companies in EBMI Level 2, 31 % of the companies in EBMI Level 3, 14 % of the companies in EBMI Level 4 and 6 % of companies in EBMI Level 5.

By confirming Hypothesis 3 within the sample for this study, we have found that more advanced and mature BMI capabilities tend to positively correlate with better performance of the companies; they correlate with SOG, SOMS and SOP (having in mind how I constructed SOG, SOMS and SOP and the need for futher related research and normative evidence). Thus, better developed BMI capabilities appear to be strongly correlated to better company's financial performance. Altogether 86 % of the companies with the highest SOP come from above average BMI capabilities zone. Higher BMI capabilities also positively correlate with the positions of leaders and co-leaders in the industry. The average value of the BMI capabilities index is the highest in the group of leaders (mean =3.4), and the lowest in the group of followers (mean=2.9).

The research has, in relation to Hypothesis 4, confirmed that maturity of strategy and overall the soft social capital and strategic capabilities, while important and pre-condition for successful BMI, should be balanced with hard, operative implementation BMI capabilities, such as organization, human resource and reward system role and impacts. The more unevenly the values of the twenty-five BMI capabilities are distributed, i.e. the more inconsistency there is among them, the more spread they tend to be and on the overall lower level, the lower the SOG tends to be. The variability among BMI sub-indexes is low and therefore the correlations between them are quite high. This means that all the sub-indexes are interrelated and thus relevant.

Against our expectations, it is not the combination of highly developed/mature TTI and of highly developed/mature BMI capabilities that seems to results in the best companies' performance in terms of financial performance over time. It appears to be the combination of low TTI and high BMI capabilities. The SOP is the highest in the groups with high BMI capabilities, independent of the level of TTI capabilities (in the combination with high TTI capabilities mean on the level of 0.0002 and median on the level of 0.0007) and in the combination with low TTI capabilities (mean on the level of 0.02 and median on the level of 0.005). In addition, as seen from **Error! Reference source not found.** and **Error! Reference source not found.**, SOP is the lowest in the case of low TTI and low BMI capabilities (mean on the level of 0 and median on the level of – 0.004), while it then increases in high TTI and low BMI capabilities (mean on the level of 0.002 and median on the level of 0.001) and over high TTI and BMI capabilities, just as in the cases of SOG and SOMS, while, again and also in case of SOP, reaching the highest value in the low TTI and high BMI capabilities segment.

Based on these findings we have developed a BMI/TTI Capability Matrix. It gave us the required basis to explain correlations between TTI and BMI capabilities in terms of performance.

3.1. Main theoretical contributions of the research

As discussed above and presented in detail in Chapter 3 (Theory), there is a growing call for more research into innovation within business models, particularly taking a more systemic and systematic look at how BMI gets done. The key gap in our theoretical understanding of BMI is both the capabilities employed for BMI and how these may be employed for continual, systematic BMI. To this I have contributed by developing the EBMI Capability Framework and BMI/TTI Capability Matrix.

I have introduced a new concept of maturity of BMI capabilities - a new EBMI Capability Framework and have explained different stages of its maturity. A new EBMI Capability Framework includes the following BMI capabilities:

- strategy (integration of innovation, integration of business model innovation, integration of business model innovation with technical/technological innovation, integration of business model innovation in business development and business model innovation strategy);
- organization (the support of management to business model innovation, internal business model innovation project management, competitive analysis of business model innovation, integration of customers/supplier and integration of other external partners);
- human resource (staff dedicated to business model innovation, managers' own perception of business model innovation, managers' perception of the importance of business model innovation for employees, employees' perception of business model innovation and education on business model innovation);
- reward system (business model innovation acceptance level, business model innovation as good practice, business model innovation recognition scheme, business model innovation financial compensation scheme and business model innovation compensation scheme integration in overall reward system);
- and business model innovation processes (strategic vs operative processes, reactive vs proactive processes, spontaneous vs systematic processes and incremental vs radical processes).

We have analyzed the structure and distribution of each of these BMI capabilities all over the sample, shown and confirmed their Gaussian, i.e. normal distributions as well we have described the behavior of each of them per se and in their comparison with the others within the sub-index and towards the integrated BMI index.

Strategy tends to currently be on a much higher level than the other "operative/implementation" sub-indexes. We have clearly traced the same tendencies of relations also within each of the separate sub-indexes. Within the organization sub-index, the capability of an overall support of management to BMI tends to score high, while the operative and implementation elements of following or not competitors' business models and of involving or not external sources in BMI efforts tend to be considerably lower.

The same is true for the human resource sub-index. A capability of managers to consider BMI as a part of their job or not appears the highest, while a very crucial operative/implementative capability of running or not any education on BMI appears very low, the second lowest of all of the twenty-five BMI capabilities. Within the reward system capabilities, there tend to be the same differences between a high leveled general appreciation on BMI within the companies on one hand and the lowest of all of the twenty-five capabilities, a big lack of a financial compensation scheme, related to BMI.

It even goes for BMI processes in exactly the same content and context. While there seems to be a tendency towards high proactivity vs reactivity, which shows that companies are moving and advancing on the BMI capabilities scale, there appears to be the lowest score within the sub-index on one of the most important operative/implementative capabilities, which is in still not reaching massive employee participation in BMI.

We have developed three different possible visualization tools to provide a snapshot of the current status of BMI capabilities in the companies, to define the required improvements, implement them and based on that monitor the progress in business model innovation achievements: BMI DNA Table, DNA Funnel and BMI DNA Pentagram.

We have confirmed the statistically relevant, though weak relationship between BMI capabilities and only four independent variables out of total fourteen, being global footprint, age of the company, size of the company in terms of the number of company's employees and market share.

The more the company is globalized, the more employees it has, the higher the market share, the higher BMI capabilities index it tends to score. Vice versa, the most important for us, the higher the BMI capability index, the more globalized the company is, the larger the size of the company in terms of the employees and the higher the market appears to be. The older the company, the lower BMI capabilities it scores, and vice versa, the higher the BMI capabilities, the lower the age of the company tends to be. All the rest of the ten independent variables are not significantly correlated with BMI capabilities.

We have developed three relative factors for measuring growth and performance, speed of growth (SOG), speed of gaining market share (SOMS) and speed of growth of profitability (SOP), all indicating longer term success of the company. Again acknowledging that they have been constructed based on available very rough indicative data, thus the derived results at this point can only be, prior to executing futher related research as indicated in Chapter 7, speculative and not yet normative. The introduction of these indicators of companies' performance however enabled us to explore the, as it turns out, important basics of positive relationship between BMI capabilities maturity and companies' performance.

Additionally, we have considered the relationship between BMI and TTI capabilities in terms of combination benefits of the two types of innovation. Independently from their relationship many important relations between these two categories of innovation could have remained hidden. Yet in a

relationship between themselves on the studied sample they started to reveale to us the real nature and impact of different kinds of innovation, separately and together, on the performance of the companies.

The research has developed a BMI/TTI Capability Matrix, capturing the essence of the indicated relationships between BMI and TTI capabilities and companies' performance. Thus we have shown that in the relationship between BMI and TTI capabilities it is predominantly the BMI capabilities level that tends to define the market position of companies and their performance. More advanced and mature BMI capabilities correlate with better financial performance of the companies, i.e. better developed BMI capabilities seem to be one of the important attributes of better companies' financial performance, also positively correlated with the positions of leaders and co-leaders in the industry.

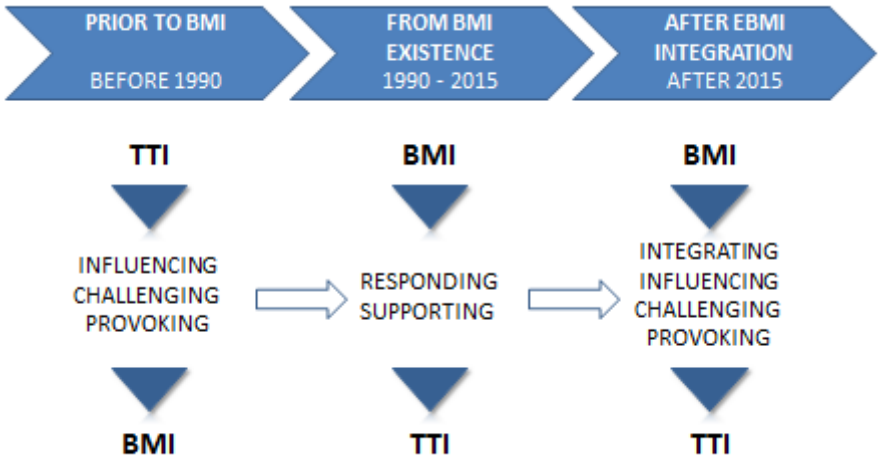
Companies can thus move from the infant level of low TTI and low BMI capabilities status by typically investing in TTI capabilities and progressing into high TTI and low BMI capabilities status. They may in addition or in parallel already also invest in BMI capabilities and thus position themselves in the high TTI and high BMI capabilities segment. Not typical, but existing and seemingly yielding the best results and performance, companies can decide not to invest and develop TTI capabilities but only or primarily develop BMI capabilities, or decide at a later stage to neglect TTI and prioritise BMI. Such direction surprisingly apperantly results in the best overall performance of the companies. It is a direction that has been chosen so far by the smallest number of companies which but tend to prosper the most.

We have through the BMI/TTI Capability Matrix detected and described a seemingly brand new type of leaders, leaders in BMI only, leaders that on purpose consciously put the TTI capabilities aside and seem to be masters of integrating their existing or new technical-technological solutions, or those of others, and tend to make more out of them than the companies that have developed them in the first place. In addition, they seem to be using BMI capabilities as an avant-garde for opening space for new TTI and tend to win on the open highly competitive scene. A sole focus on BMI capabilities rather than in parallel also on TTI capabilities is exposed as the seemingly single best performing strategy in terms of innovation and its impact on company's growth and performance. Companies which do not invest in TTI capabilities and keep them low, while they are substantially investing in BMI capabilities, tend to develop a completely new, so far largely neglected, i.e. not yet identified successful business model. They are typically younger companies that appear to grow their market shares as well as their sales the fastest and therefore tend to already reach significant absolute size both in terms of sales as well as in terms of the employee numbers. Their secret seems to be in the enhanced BMI capabilities, which tend to support a wise diversification of the businesses, coming from the wide range of possibilities arising from applying the new business models. Having no or very low TTI capabilities, at the same time the companies seem to either use the existing technical solutions, i.e. access the TTI of others and leverage them through new, more competitive business models. This tends to decrease heavily the investments required for TTI and consequently appears to shorten the time to market, speeding up growth, market share and profitability.

Based on all the aforesaid, the BMI/TTI Capability Matrix offers us a model, based on which we can, knowing certain existing variables, define the rest of the variables and envisage the existing and future result of the companies with a high degree of probability. Therefore, a BMI Capability Matrix can, besides being the tool for proactively enhancing company's performance, also be the tool for predicting the success of the companies for the future. That is, on the basis of the current company's BMI/TTI Capability Matrix position and its trend in time we may be able to predict what the development of their performance will look like in the future. This all of course requires further testing and research.

BMI capabilities actually do not only tend to exist to support, realize and enrich, i.e. to "follow" TTI capabilities, BMI itself appears to represent a powerful resource and capability for creating new wealth and value, i.e. it may also "lead" and by that efficiently employ the existing and require and provoke new TTI. It may act "independently" of the TTI and lead, while TTI follows.

Figure 8: The changed role of innovation in society



With the findings from the BMI/TTI Capability Matrix and their integration into the EBMI Capabilities Framework we are after opening new dimensions in understanding the role and potentials of BMI, particularly in their relationship with TTI and thus of innovations as such. In EBMI Level 5 companies do not only tend to fully integrate the TTI and BMI capabilities, but BMI capabilities also seem to start to act and start to create conditions and space to influence, require, provoke and create new TTI, as well as tend to start acting independently on TTI.

While so far according to existing knowledge TTI has been requiring and provoking changes in business models, we now know also about the tendencies that also the opposite (BMI provoking TTI) seems not only possible and already taking place in companies, but may be, at least with respect to the sample involved here, even more efficient in terms of company performance.

This leads us to further speculate on how far a focus on BMI and BMI capabilities could be applied to wider economic concerns. In recent years we have witnessed significant economic turmoil. This economic turmoil has challenged, and is challenging, many of the traditional business models. While many responses to economic change are rooted in innovation, they tend to be technical and technologically focused. What my research has shown is the potential of focusing instead on BMI to achieve better economic results. While I cannot yet normatively say, based on the study represented here, that BMI is 'the' way forwards, what I can say is that it holds much promise and, from my informed perspective, should be given much more overall attention to help move us beyond the current economic problems faced.

BMI/TTI Capability Matrix and EBMI Capability Framework have the potential to provide a significant contribution for filling the gap in theory and building up a concrete framework for structured systematic processes of BMI instead of the more random nature of BMI to date. The work represented here serves as a foundation for further research in BMI to further elucidate and test the concepts and model developed. They provide a new fresh insight into the BMI theory and may represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, systematic continual BMI.

3.2. Main practical contributions of the thesis

Theoretical and conceptual developments are strong starting points for business professionals to assess and plan their future strategic decisions. I believe the work developed here – particularly the description of BMI capabilities, BMI/TTI Capability Matrix and EMBI Capability Framework – may offer highly beneficial structures for companies to innovate more effectively. Besides potential for covering an important gap in theory, the BMI/TTI Capability Matrix and EBMI Capability Framework

tend to also cover an important gap in innovation practice in companies and in the related practical knowledge of company managers and leaders.

Based on the outcomes of this study, BMI capabilities may have a strong influence on the level of performance in the companies. Therefore, managers and their management teams should increase their interest and engagement in BMI as such and in the development of the related BMI capabilities. This study strongly suggests that these should become greater preoccupations for practicing managers. According to the research, most companies seem to be engaging in BMI only sporadically and not continually, and are not yet building their BMI capabilities systematically.

The findings discussed above show that, within this sample of the European Automotive industry, investment in BMI in terms of results seem to outperform investment in TTI. This should be a point of considerable reflection both for academics in future research as well as for business schools and managers as they make decisions of where to place investment in innovation.

Through the EBMI Capability Framework, managers should now be able to understand the core gaps that occur in BMI practice. Besides the fact that the strategic part of BMI in the companies usually tends to be developed on a much higher level than operative or implementation capabilities, we now know that we seem to be facing the same gap between strategic and operational capabilities also within each of the separate BMI capabilities.

For example, within the organizational capabilities, a capability of an overall support of management to BMI tends to score high, while the operative and implementation elements of following or not competitors' business models and of involving or not external sources in BMI efforts seem to be considerably lower. The same is true for the human resource sub-index. A capability of managers considering BMI as a part of their job or not tends to be the highest, while a very crucial operative/implementation factor of running or not any education on BMI seem to be very low. Within the reward system capabilities, there appear to be the same differences between a high level general appreciation on BMI within the companies on one hand and the lowest of all of the twenty-five capabilities, a big lack of a financial compensation scheme, related to BMI.

While there seems to be a tendency towards high proactivity vs reactivity, which shows that companies tend to move and advancing on the BMI capabilities scale, we still are getting the lowest score within the processes sub-index on the most important operative/implementation capabilities – in still not reaching massive employee participation in BMI.

What the study has shown is that successfully innovating and performing companies seem to be the ones in which managers interconnect their BMI capabilities with their TTI capabilities. They tend to integrate them into their overall business development activities within a well-defined BMI strategy and even start to prioritite BMI capabilities over TTI capabilities. Based on this, the implication is that managers should focus far more on BMI and should consider it as a part of the regular work of their team members, they should encourage their employees to get involved in BMI efforts and, before everything else, they should run extensive education on BMI. They should develop recognition schemes, related to BMI. These schemes should become a consistent integral part of an overall reward system, including a financial compensation scheme. So much more since the very best performing companies seem to be those practicing BMI as a priority and largely neglecting TTI.

The EBMI Capability Framework provides managers a road map for understanding their current status of BMI capabilities, for identifying the gap in these capabilities towards the targeted capabilities, working out the plan for developing these capabilities systematically and developing them. The EBMI Capability Framework also provides a basis for monitoring the progress and checking the improvements in BMI performance. For this purpose, three concrete new visual tools have been developed: EBMI Table, EBMI Funnel and EBMI Pentagram.

The EBMI Capability Framework also enables managers to provide for benchmarking in BMI, to compare their BMI capabilities with the capabilities of other companies in the industry and/or with the companies in other industries and even areas of life, with their suppliers, customers, etc., and it thus enables managers to learn from the best in the industry and wider, based on a direct comparison of specific capabilities of BMI capabilities index and its sub-indexes.

It enables companies to understand according to which business model they are operating, what the business models of their competitors are and what the new, innovative business models could be to further improve their performance by moving from sporadic to continual BMI. It enables them to develop a relevant and highly efficient BMI strategy and develop the related organization, human resource, reward system and processes for developing BMI.

With the EBMI Capability Framework, managers can systematically develop their BMI capabilities and assure continual BMI ideas and their implementation, ranging from small, upgrade BMI to strategic, break-through BMI, just like in case of TTI innovation. EBMI Capability Framework enables the integration of BMI and TTI and guides companies to the related improvements in performance.

The EBMI Capability Framework has the potential to become a valuable tool for practitioners, managers, leaders and boards, since it should help them to move forward with continual BMI. It should enable them to assess and improve their BMI performance, strengthen companies' abilities (and the abilities of whole industries), boost their competitive positions with existing products and markets, open completely new markets and re-shape whole industries. EBMI Capability Framework is designed to possibly substantially improve the ability of organizations to continually develop BMI and successfully execute them in practice. The aim of the EBMI Capability Framework is to possibly enable the companies to move from the situation "as it is" to the "to be" situation, that is to also prescribe, and to compare, to benchmark the capabilities not only to competitors, but also wider. The EBMI Capability Framework tends to integrate the development of BMI capabilities into an overall process of strategic business development planning of the company and aims at establishing a culture of continual innovation of business models. The goal of the EBMI Capability Framework is to possibly provide an important contribution to faster growth of companies and industries, to the growth of overall stakeholder value and to overall economic development.

Intense and continual TTI started randomly decades ago and is today run systematically. By applying the EBMI Capability Framework and growing BMI capabilities also BMI should evolve into a well-run system, generating new value to companies and economies more broadly.

With the specific support and implementation of the BMI/TTI Capability Matrix, managers should be able to understand in which part of the matrix they are currently positioned, how the company came there and what opportunities the company has to further enhance its innovation achievements, either by also integrating BMI or even by experimenting with "BMI only" approach in some cases. Thus BMI/TTI Capability Matrix should be a useful resource for guiding a balanced development of the different innovation capabilities in companies in different cases/situations. It should enable them to improve performance, decrease cash-spending, and shorten time to market and time to pay-back. On the other hand, the BMI/TTI Capability Matrix besides being the tool for proactively enhancing companies' innovative and financial performance, it also should develop into a tool for predicting the success of the companies for the future. That is, we should predict on the basis of the current BMI/TTI ratio and its trend and on current and expected future positioning of the company within the BMI/TTI Capability Matrix, what the development of their performance should look like in the future.

3.3. Limitations and opportunities for further research

After many scholars and practitioners have called for more empirical research in the field of BMI we have so far still not managed to provide a critical mass of such studies to be able to considerably

improve our understanding of BMI and move to the next level of their employment and results. The present study re-confirms how important and how deeply revealing a profound empirical research in BMI can be and needs to be. An enhanced and continual stream of empirical research of BMI is highly required to get a much better insight into the real nature of BMI.

In order to re-confirm, validate, strengthen and upgrade the valuable so far speculative results of the present thesis, convert them into normative and support their successful implementation, numerous further empirical studies are needed. In particular empirical studies that consider BMI as a dynamic capability would be highly valuable. There would be great value in more studies like the one I have completed, focused on different industries and sectors. Additionally, more qualitative studies looking at the practice of BMI at a grounded level in teams, departments and companies would add subtler insights into how BMI gets done on a day-to-day basis.

As the intriguing discoveries in terms of BMI and its relationship with companies' performance have evolved and have been upgraded based on the potentials of available data and while these data have enabled the important related so far speculative findings, on the other hand they also represent an important limitation. That is, the data from which SOG has been constructed are all based on relative data and on important approximation. In terms of sales, instead of exact sales amount only the level of sales within a certain range is available, therefore important averaging and approximation has been done in that respect, which could cause important deviation. The same is true for the age of companies - we have been sourcing these data from the decades range and averaging them, so here certain deviations are also possible. The same goes for SOMS, where we have been obtaining the market share from a narrow range of classes' distribution of 3 % and averaging them, while in terms of companies' age the same comments are valid as per the SOG. Concerning SOP, approximation is even bigger. In the study, we only have a general description of profitability performance available from which we have been, by confronting it with the approximation of the companies' age, developing a relative profitability performance indicator. In order to be fully sure about the obtained relations and to re-confirm the results, we need to re-check all of the claims made on the present sample also by providing exact absolute data on all of the mentioned categories/factors, i.e. exact age of the company, exact sales amount, exact market share as well as exact profitability, in absolute terms and in terms of % on sales.

Due to the fact that the present study only gives us one snapshot in time and that time in very many respects is one of the core variables, repeating this study or studies like it, is crucial. As the time goes by and as BMI capabilities evolve, it will be very valuable to compare the current situation with the future one anticipated by this study, to compare the development of all of the measured elements in time, gain more information on the actual speed of its development and re-assess the core findings.

Based on the obtained and available survey data, in the next step of this research, based on the results of the quantitative study, the most advanced/mature companies in BMI capabilities that differ most positively from the average and are performing exceptionally well (companies from Level 5) should be the subject of future qualitative study. The same goes for the required deep look into companies with the best/highest developed combination of the TTI and BMI capabilities.

A special challenge is represented by the need to understand the 12 % of the companies, 15 of them, excelling at BMI capabilities while neglecting TTI capabilities and consequently obtaining the very best performance. Looking into the companies in this group, into the 12 % of the total sample or 15 concrete companies and into their related characteristics and executing interviews with their CEOs, wider management and employees and understanding more in terms of how they operate is an important direction for further study. By doing that, we can and must gain deeper understanding of the current practices in the BMI capabilities field from a grounded, everyday perspective.

Additionally, this research project is geographically and geo/strategically focused and thus limits itself on Europe, including both traditional western as well as new eastern transition European economies, having in mind certain similarities, but also considerable differences. Thus it will be very valuable to

conduct such a study in the next steps also in the USA, Japan and other economies in order to draw additional conclusions based on relevant comparisons. So, while the automotive industry in the EU is a globally leading part of the industry, a comparative study should also be provided in two core counter-parts in the automotive "triad" of the developed world, i.e. in the USA and in Japan, while also making a comparison with the status of rapidly growing automotive industry in Brazil, Russia, India and China.

While the study has been executed in a typical moderately dynamic industry, i.e. automotive industry in the EU, in order to additionally empirically confirm the validity of the EBMI Capability Framework, further empirical studies in other relevant moderately growing industries in Europe and globally are required. We need to provide according relevant cross-industry evidence.

The study also needs to be applied to the fast growing, i.e. highly dynamic industries, like ICT, to capture an additional/different notion of the BMI capabilities behavior in such cases and check on possible learning points from there also for moderately growing industries, to advance even quicker.

While we have so far confirmed BMI capabilities as related to financial performance over time we have so far not been able to specifically check the relation more profoundly concerning the absolute profitability. We have only measured profitability in relative terms and only for the last short 4 years, within that for one year only as forecast. While detecting a positive correlation, more work needs to be done to re-asses it.

The study has only superficially touched on the important issue of strategic relationship between BMI and TTI capabilities and their interrelationship, which therefore should be studied much deeper. A specific study focused on understanding of the companies with high BMI and low TTI capabilities and their processes – a qualitative study of these companies and an in-depth view into how they function and why is required.

While the study has been limited to private/business environment, the similarities and differences to public sector or non-governmental, non-profit and similar organizations could be of great interest.

3.4. Final Summary

The goal of this study and survey is to further explore BMI and its related capabilities as powerful resources for generating new value and provoking new TTI and to provide concrete tools for assuring continual BMI.

The developed BMI/TTI Capability Matrix and EBMI Capability Framework tend to represent an important bridge from the existing theories on mainly random BMI to the future of fully integrated, embedded, systematic, continual BMI and to developing BMI alone not only in combination with TTI. The EBMI Capability Framework tends to become an important tool for practitioners to adapt their companies to the ever faster changing environments and to proactively provoke productive changes within them. The BMI/TTI Capability Matrix seems to have the capacity to challenge the dominant logic that the combination and cross-link/cross-integration of TTI and BMI capabilities is the best option for achieving superior company growth and performance, since the results on the present sample strongly indicate that a focus solely on innovating business models may yield the highest enhancement of growth and performance.

Our desire is that this project will importantly inform and influence innovation management practice in the future. Just as importantly, we hope that this study motivates more work on BMI in general, adding further to our empirically grounded understanding of it.