
The Business Model Ecosystem

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Received 1 September 2016; Accepted 20 October 2016;
Publication 25 November 2016

Abstract

There is much knowledge about Business models (BM) (Zott 2009, Zott 2010, Zott 2011, Fielit 2011, Teece 2010, Lindgren 2013) but very little knowledge and research about Business Model Eco system (BMES) – those “ecosystems” where the BM’s really operates and works as value-adding mechanism – objects or “species”. How are these BMES actually constructed – How do they function – what are their characteristics and How can we really define these BMES?

There are until now not an accepted language developed for BMES’s nor is the term BMES generally accepted in the BM Literature. This paper intends to commence the journey of building up such language on behalf of case studies within the Wind Mill, Health-, Agriculture-, and Fair line of BMES. A preliminary study of “AS IS” and “TO BE” BM’s related to these BMES present our first findings and preliminary understanding of BMES. The paper attempt to define what is a BMES and the dimensions and components of BMES. In this context we build upon a comprehensive review of academic business and BM literature together with an analogy study to ecological eco systems and ecosystem frameworks. We commence exploring the origin of the term business, BM and ecosystems and then relate this to a proposed BMES framework and the concept of the Multi BM framework (Lindgren 2013).

Keywords: Business model Ecosystem, Business Model, Business Model Innovation, Ecosystems.

Journal of Multi Business Model Innovation and Technology, Vol. 4.2, 61–110.

doi: 10.13052/jmbmit2245-456X.421

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1 The History of Business Model Eco System (BMES)

The first discussion on Business Model Ecosystem (BMES) can be traced back to an academic article in 1934 (Fiel, 2011). However, the concept did not really gain wide acceptance until Fiel in the mid-1990's (Fiel, 2011) again raised the question – How can a BMES be defined? Fiel comment that:

The term “Business Ecosystem” was originally used and introduced by Moore (Moore 1993) in his Harvard Business Review article, titled “Predators and Prey: A New Ecology of Competition”. Moore defined “business ecosystem” as:

“An economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world. The economic community produces goods and services of value to customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders. Over time, they coevolve their capabilities and roles, and tend to align themselves with the directions set by one or more central companies. Those companies holding leadership roles may change over time, but the function of ecosystem leader is valued by the community because it enables members to move toward shared visions to align their investments, and to find mutually supportive roles.”

Moore used several ecological metaphors, suggesting that the business could be regarded as embedded in a (business) environment, that it needs to coevolve with other businesses, and that “the particular niche a business occupies is challenged by newly arriving “entrants” (Porter 1985) or potential exit businesses. Moore further argued to defining the ecosystem as related to the business level and not to the business model level (Skarzynski 2008, Osterwalder 2010, 2011, Lindgren 2013) meaning that Business Ecosystems should be defined related to the highest level of a business – the business level and as an ecosystem of businesses or for businesses.

DeLong (DeLong 2000) defined business ecology as “a more productive set of processes for developing and commercializing new technologies” that is characterized by the “rapid prototyping, short product-development cycles, early test marketing, options-based compensation, venture funding, early corporate independence”.

Many have tried to defined a group of businesses as e.g. a cluster (Porter 1998)

“a geographical location where enough resources and competences amass reach a critical threshold, giving it a key position in a given economic branch of activity, and with a decisive sustainable competitive advantage over other places, or even a world supremacy in that field (e.g. Silicon Valley, Hollywood, Italian clusters (Dógllo 2011), Danish Wind Valley (Monday Morning 2010), (Genoff 2010).”

or a sector – Lanager (Langager 2010) as he comment on the difference between industry and sector as:

The terms industry and sector are often used interchangeably to describe a group of companies that operate in the same segment of the economy or share a similar business type. Although the terms are commonly used interchangeably, they do, in fact, have slightly different meanings. This difference pertains to their scope; a sector refers to a large segment of the economy, while the term industry describes a much more specific group of companies or businesses.

A sector is one of a few general segments in the economy within which a large group of businesses can be categorized. An economy can be broken down into about a dozen sectors, which can describe nearly all of the business activity in that economy. For example, the basic materials sector is the segment of the economy in which business deal in the business of exploration, processing and selling the basic materials such as gold, silver or aluminum which are used by other sectors of the economy.

Each of the dozen or so sectors will have a varying number of industries. . . . For example, the financial sector can be broken down into industries such as asset management, life insurance or as e.g., northwest regional banks. The Northwest regional bank industry, which is part of the financial sector, will only contain businesses that operate banks in the Northwestern states – a geographical approach.

An industry according to Langager (Langager 2010), on the other hand, describes a much more specific grouping of businesses with highly similar business activities. Essentially, industries are created by further breaking down sectors into more defined groupings.

Porter (Porter 1985) defined and agreed upon the term industry as referred

“to the environment and the forces close to a business that affect its ability to offer its value propositions to customers and make a profit.”

1.1 The “Barriers” or “Boarders” of BMES

Porter argued that a change in any of 5 forces – buyers, suppliers, new entrants, substitutes and exit and entry barriers normally would require that a business had to re-assess “the marketplace” given the overall change in industry formation. The overall industry according to Porter does not imply that every business in the industry have the same value formula (Lindgren 2013) as businesses apply their business models differently.

The industry could in this sense be regarded as equivalent to a BMES – however still taken into account that Porter argues to business operating in an industry and not businesses operating with one or more business models (Markides 2004, Markides 2008, Casadesus-Masanell 2010, Lindgren 2013, Markides 2013). Hereby – according to our findings – Porter may be lacking more or less some fundamental dimensions of a BMES – the value chain functions, the competence, the value formula and not least the relations of the BMES. Further most cluster, sector and industry frameworks come out of a geographical and physical notation – “thought world” (Dougherty 1992). Porter argued that cluster and industries help productivity, boost innovation and encourage new businesses to evolve. Porter also claimed that business’ geographical proximity, their close competition with each other and the growth of specialized suppliers and production networks around them made a winning combination.

However many clusters and industries globally seems to be ailing these days – like many ecosystems in biology also do today – e.g. because they are victims of low-cost competition or in biological ecosystems they are “squeezed” out of their ecosystems by “smarter” species that have adapted to change in the fundamental conditions to the ecosystem with different wants, needs and demands to the output of the ecosystem. They “play” a “different model” for survival and growth.

In Como, Italy e.g. – an old cluster of silk businesses had for a long time been ailing, and so was also an old wool cluster around Biella together with the Castellanza cluster. Globalization – a typical change and influencer to the BMES basic conditions – had simply made clustering and the formation of industries in this area far less certain – maybe not any longer meaningful.

Business today seems not to be able to protect themselves and hide themselves behind the borders any longer – the barriers and borders of clusters, sectors or industry's as Porter proposed previously (Porter 1985). More open trade, improved transport links and the internet among others explanations mean that bunching together in a cluster, sector or an industry no longer offers strong defense against e.g. cheaper foreign rivals – or business with different BM's. E.g. Italy's medium-sized industrial businesses adapt to the threat from China and the benefit they previously got from being bunched together in a cluster seems to be weakening (Helg 1999).

Fragmentation of production, value chains and outsourcing abroad are clear signs that business have become less competitive, weaken their networks on which clusters were built and may even facing that they are being destroyed their previous competitive advantage by clustering or acting as if clustering, sectors and industries still exists.

Successful BMES in the future may have to be established and look different from those we know of the past. The approach to the term BMES and our viewpoint to BMES may have to become seen differently than as previous terms like industry, sector and cluster surrounded and related to physical and geographical borders. Context borders and approaches might be giving us different and even better strategic advantage to previous terms and “thought worlds”.

A deeper and new understanding of BMES could therefore maybe give us some different and new answers to why some BMES are successful and others not – and why a BMES terminology that is more context based defined – could be valuable to future BMI and Business model innovation leadership (BMIL) Lindgren 2012.

1.2 The “Barriers” or “Borders” of BMES

Porter introduced the terminology barriers related to Industries. In a BMES context we propose to increase this terminology as not just defined as related to physical and geographical barriers surrounding the BMES – but also related to the digital, virtual and maybe even more important the perceptual barriers of BMES. We propose that barriers in a BMES are context based and really dependent on “who are seeing and sensing” the barriers – or “borders” of the BMES. A BMES formation – we propose – can be much wider than Porters Industry and Cluster term – and even cross or mix previous traditional defined cluster and industry barriers. We claim that this can be an important explanation to why clusters, sectors and industries are suffering today – and

even some vanishing – because they try to protect themselves behind barriers that really no longer exists, other business do not see – except in their or others (government, societies or even academics) perceptual picture, viewpoint and mental mindset.

The threat of substitute BM's, the threat of established rivals, and the threat of new entrants – **the 3 forces of horizontal competition** – and the bargaining power of suppliers and the bargaining power of customers – **the two forces from 'vertical' competition** – have previously (Porter 1985) been regarded as deciding the “BM organization in the industry” and thereby in our term the “BMES culture” – according to Porter the degree of rivalry between Businesses BM's.

However, as can be seen previous cluster, sector and industry terminologies were very much defined as related to **the business** and **a single business** – whereas the BMES terminology is related to the BM and the manifold of BM's that a business really have and potentially can create. As we argue that business have more than one business model (Lindgren 2013) and that business are seldom represented with their whole business in just one BMES – all their BM's in one BMES – but with “parts of the business” – one or more BM's – in one BMES and other BM's in different BMES we argue that

“a business model ecosystem is representing more business models from more businesses.”

“a business is seldom represented in just one business model ecosystem but is more often represented by different BM's in more Business model Eco systems.”

Figure 1 shows a conceptual model of one BMES with a business offering some of its BM's to the BMES – the full line triangle and potential BMES in the horizon – the dotted lined triangles – representing BMES that the business is not part of.

1.3 Energy in a BMES

The flow of energy through an ecosystem is classically considered as the primary driver of any ecosystem according to Lindemann (Lindemann 1940). The flow of energy in and industry, sector and cluster has not yet been fully verified – however some claim that profit is the main driver of any business and thereby industry (Max 1867). Lately we have seen that many business ecosystems real drivers seem to be related to other value than profit

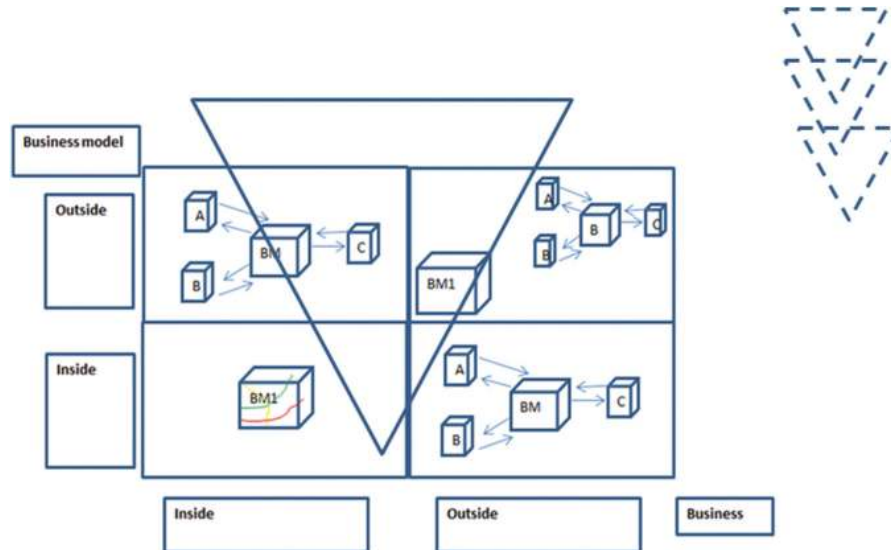


Figure 1 Business models and business model ecosystems.

Source: Lindgren and Horn Rasmussen 2012.

(Amidon 2008). In our BMES research we found that the flow of value is one driver of BMES (Amidon 2008, Alee 2011, Lindgren 2013). However we found that there maybe more drivers to BMES but it seems as if both profit and also other values plays fundamental roles to any BMES, Business and BM’s “energy” and their “triggers” to make value create, capture, deliver, receive and consume.

A “system approach” has earlier allowed detailed studies of ecosystems energy and material flow (Odum 1953). A value stream analysis of a BM (Alee 2011) allows also a preliminary study of some of the BMES value flows (OMG 2015). We claim that values are exchanged through BMES internal tangible and intangible relations – and also between BMES external tangible and intangible relations. The last we note here as a hypothesis as we have not yet been able to in large scale to verify empirically value stream flow between different BMES. Research (Amidon 2008, Russels 2011) however claim this is the case.

1.4 Business Model Innovation in a BMES

The different BM’s participate together in BMES to create, capture, deliver, receive and consume (Lindgren 2013) value, which also sets the competence

and capabilities of any BMES but at the same time also – we claim – the limits of Business Model Innovation (BMI) and potential of BMI in BMES. This is why some business take out their BM's from some BMES and offer them to other BMES (Chesbrough 2007) – as they consider some BMES more sustainable and valuable than other BMES in the future. E.g. some fossil energy businesses late in the 2000 slowly began to move from the fossil BMES and enter renewable energy BMES (EON, Shell, Statoil, DONG). IBM also showed this trend by leaving the Personal Computer BMES and focusing on the Service BMES.

The amount of competence inside each BMES BM's and the amount of BM's value flow in and out of a BMES – we claim – sets the limits of the BMES BMI competence, capability, growth and even survival potential. It is vital to any BMES to know about its competences and it is essential to any BMES to receive value, be able to capture value – with preference new value – and also to be able to consume the value offered. However – which has not yet been focused much upon in research – any BMES also over time have to be able to relate and deliver value to other BMES. Very few BMES over time can stay as a lonely island – a isolated BMES. BMES's needs to relate and interact with other BMES otherwise they will be challenged.

1.5 The Business Model Ecosystem Relation Axiom

The flow of value in and out a BMES can be mapped in any BMES and its BMI processes (Lindgren 2013). Therefore it is important to view any BMES in different “perspectives”, which Figure 2 illustrate.

Figure 2 shows a model of value flow in a different viewpoint of a BMES,

Quadrant 1 – Internal the individual BMES – A part of a BM's value flow inside a BMES – example difrerent Business BM value flow in Wind Mill BMES.

Quadrant 2 – BMES's vertically related – BMES related as suppliers and customers to each other in an “upstream” and “down stream” value flow – example BMES value chain (Energy BMES's – coal BMES to electricity BMES to household BMES).

Quadrant 3 – BMES's horizontally related – BMES related as “colleges” in related BMES – example (oil-, gas-, solar-, electricity in energy production).

Quadrant 4 – BMES's not related – BMES's that are not related to and do no value exchange. Wind Mill BMES and Circus BMES.

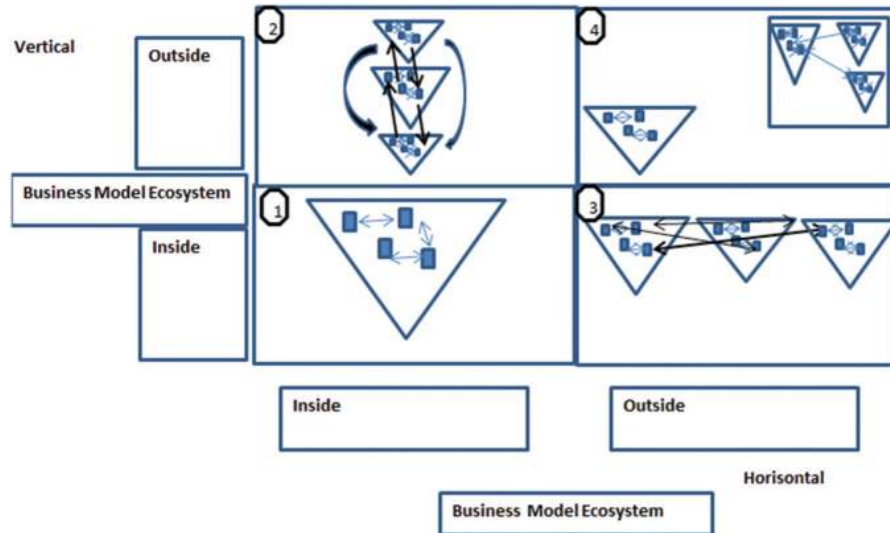


Figure 2 BMES relationship axiom inspired by Lindgren and Horn Rasmussen 2013.

Any BMES are highly dependent, influenced and related to both negative and positive values and value streams from other BMES. However, value cannot flow between BMES without one or more relations are created between the different BMES. This means also that potential value of a BMES cannot be transferred and used in another BMES without relations are established. The study of value flow and relations inside and external BMES hereby becomes important to focus on – to verify are there relations and do value transfer through the relations – to and between which BMES. A BMES relation and its BM's relations to other BM's in different BMES are fundamental to map carefully to understand the status a BMES and and its potential to BMI. Otherwise it will be nearly impossible to understand the construction and context of a BMES and the growth, survival and potential development of BMES.

2 Design/Methodology/Approach

The methodology applied in the paper is structured around deductive reasoning. First, a theoretical background of BMES theory on each dimension of a BMES is presented to provide a foundation for the dimensions of a BMES. To verify the existence of the dimensions of the BMES and the usability of the

BMES, four BMES cases are presented within – The Danish Energy BMES Case. The Danish Renewable energy BMES Case, and the HI BMES case. To “stress test” the generic use of the BMES framework, the cases represent four very different BMES with different context of BMES dimensions and components. All cases are chosen to exemplify the concept of the BMES in different stages of a BMES life cycles right from construction of a “TO BE” BMES, to operating “AS IS” BMES’s and as a BMES that is laid down to die and prepared to vanish from the Scene.

The information and data from the four cases were gathered through active participative research (Wadsworth 1998) carried out over seven years in the EU FP 7 IOT project Neffics (NEffics 2013) 2008–2013, EU project – Wind in competence project – 2011–2014. Based on these cases supplemented with other empirical uses cases and tests, a final approach for a definition of the BMES concept is formulated and is discussed and illustrated in the next paragraphs.

3 Characteristics and Dimensions of a Business Model Eco System (BMES)

An ecosystem is traditionally regarded as “a community of living organisms” (plants, animals and microbes) in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system. A BMES is proposed analogically as a “community of living BM’s” where different businesses offer their “AS IS BM” and develop their “TO BE BM” in conjunction with the BMES environment (things like technologies, HR, organizational structure and culture). In this context and in our approach BM’s that are under construction is also “living” BM’s in the BMES as these use energy and competences of the BMES on innovating these “TO BE” BM’s.

We distinguish here to other frameworks (Porter e.g.) by focusing on the BM’s and not the Business as forming the BMES. We argue that Business offers their BM’s to the BMES – but very seldom their total amount of BM’s and thereby their total business to a BMES. In our research (Windmill BMES, Velvet BMES, Fair BMES, Building BMES, Furniture BMES, Food BMES FOOD TECH BMES and Energy BMES) we found that Business seldom offer all their BM’s in just one BMES. Businesses are most often spreading their BM’s to more BMES – to gain more business, spread risk strategically or because of other reasons. Our research showed that Business who offer all or

nearly all their BM's to one BMES often face large strategy risk, are easier to set under value and cost pressure by customers, suppliers and competitors. The strategic best practice sentence – “Stick to Your core business” (Abell 1983) is therefore maybe not fully true in all business context because the business can be strategically trapped in one BMES by doing so. The strategic best practice sentence “focus on Your core competence” (Prahalad and Hammel 1990) – can be true, when a business offers the same value proposition to more BMES – but can be strategically risky if BMES context based change.

We distinguish to most industry, sector and cluster research and approach with the BMES approach, as they do not consider and included the “TO BE” BM as part of the BMES – what they call a market (Kotler 1983), Industry (Porter 1985), Cluster (Porter 1985). We argue that “TO BE” BM's are equal important part and valuable to any BMES or to many BMES as there is e.g. customers, suppliers and value proposition that are “flowing” into and out from the BMES and hereby influence highly the BMES although these BM's are not fully developed. As an example we found that “TO BE” APPS development and new gaming software development in Silicon Valley incubation environment are influencing the “AS IS” BM's in the APPS- and software BMES – and some of these “TO BE” BM'S are even “traded” before final launch – even at idea and concept phase.

We acknowledge that many business and societies put their primary focus – and borders around – and on the BMES's “AS IS” BM's – but we point to that this is not giving the full picture and understanding of all BM's, dimensions and characteristics of a BMES. THE “TO BE” BM's and the proposed “TO BE BM's” indeed influences and “value” the rest of the BMES BM's. Businesses use tremendous resources and energy from the BMES and even other BMES to carry out their BML. The BMES also use energy to protect their “AS IS” BM's from “TO BE” BM's. “TO BE” BM's can be serious and important drivers to the change of “AS IS” BM's in the BMES and can simply also be the source – and give energy – to changing the organizational system and whole culture in a BMES – even in vertically and horizontal related BMES. Amazone, Itunes and Netflix are just some examples of business with their BM's that have influenced highly existing BMES in retail, music and film. “TO BE” BM's can disrupt BMES and sometimes be the drivers to revitalize existing BMES and related BMES. “TO BE” BM's can naturally be the driver to the establishment of new BMES, which Second Life, World of Warcraft and the Tinder Box Festival in Denmark (Tinderbox.dk) are examples of.

3.1 How Can “the Borders” to BMES then Be Defined?

Physical borders like land, countries and continents have for many years been regarded as the borders to markets, industries, sectors, clusters and even businesses. Digital and virtual borders in cyberspace as Google Search, Apple iTunes, Blizzard – World of Warcraft, Zynga – Farmvillage, Viasat TV platform, TDC mobile network are just some examples of BMES which do not follow these borders – but follows different borders. often independent of the physical world. Some digital and virtual BMES are free to the user to access (Google Search, Wikipedia) – others are not (Disney World Paris, Legoland Billund). In the latter You have to be a customer to access. Digital and virtual BMES do most often not stick to the physical borders of yesterday and push us to change our previous understanding of markets, industry, sectors and clusters.

Kotler (Kotler 1983) described a market as consisting of values offered to customers to fulfill their wants, needs and demands. Markets consisting of customers and suppliers, who exchange their values (products and service) for money. Market with market leaders and market followers competing each other and preventing new entrants to enter the market. Kotler also described markets as those with special demands for value “niche markets” and those with indifferent demands “mass markets”. All as small BMES – ecosystem or communities with special or indifferent value demands. The customers value demand and the supplier’s value offers as borders for “the ecosystem” and the money as the final determinant of whether a market exists or not.

Porter (Porter 1985) described it somehow differently. He defined any industry related to entry and exit barriers – “Borders” – to their industry. “Exit barriers” – preventing business to slip out of the industry and “entry barriers” preventing substitutes and new entrants to slip into the industry. Obstacles that make it both difficult to exit and enter an given industry. Hindrances that a business faces in trying to exit an enter an industry with its BM’s – such as capital investment, government regulations, taxes and patents, or a large, established Business taking advantage of economies of scale – or those lack of competences a Business faces in trying to gain entrance to a profession – such as technology requirements, education or licensing requirements, organizational requirements or cultural practice. Because entry barriers protect incumbent businesses and restrict competition in an industry, they can contribute to distortionary value formulas. The existence of monopolies or industry power is often aided to barriers to entry – and thereby “the borders” to an industry.

Both Kotler and Porter describes “Ecosystems” – as with special habits, rules, practice – “culture” (Kotler 1983) – B2C markets, B2B markets, (Porter 1985) – rivalry, cost leaders, niche and focus strategist. However, the business environment seems in many cases only to be true if these boarders really exists. We claim that they might not be existing any more or are quickly vanishing.

It seems that they have begun to change or even vanished since the early 1980ies especially with the internet pushing and disrupting boarders of markets, industries, sectors, clusters. The internet also providing the opportunity to act in physical, digital and virtual BMES simultaneously or integrated.

So to answer the question – what are the boarders to a BMES it might be valuable to rethink the term barriers and borders – and instead think them as context based. In this case we commence our inspiration and draw analogy to ecology science.

*The biotic and abiotic components of an ecosystem have been regarded as linked together through nutrient cycles and energy flows. A **nutrient cycle** is the movement and exchange of organic and inorganic matter back into the production of living matter. The process is regulated by **food** pathways that decompose matter into mineral nutrients. Nutrient cycles occur within ecosystems. Ecosystems are interconnected systems where matter and energy flows and is exchanged as organisms feed, digest, and migrate about. Minerals and nutrients accumulate in varied densities and uneven configurations across the planet. Ecosystems recycle locally, converting mineral nutrients into the production of biomass, and on a larger scale they participate in a global system of inputs and outputs where matter is exchanged and transported through a larger system of biogeochemical cycles. (Chapin 2002)*

Ecosystems have been defined by the network of interactions among organisms, and between organisms and their environment: The ecosystems are said to be of any size but usually encompass specific, limited spaces (Chapin 2002, Schultze 2005). However some scientists even says that the entire planet is an ecosystem (Willis 1997, Schultze 2005, Krebs 2009) – indicating that the boarders of ecosystems depends on the context and the viewpoint of the viewer(s).

The tangible and intangible dimensions and components of a BMES are proposed as linked together through relations (Amidon 2008, Alee 2011,

Russels 2012). Relations “binds” BM’s “context wise” together in BMES and they are the “channels” – equal to pathways in ecology research – in which values are carried from one BM dimension to another BM dimension. Relations set the borders for how far the value proposition of a BMES BM’s can reach out and potentially exchange values to other BM’s – either inside or outside the BMES. Relations are the vital dimension in a BM and a BMES that can carry value – hereby enable value exchange and fulfill a value cycle or a value flow.

When BM’s in BMES are related they can potentially exchange value – but there is no guaranty for value flow and value exchange. Value flow and value exchange are dependent on the value cycle will take place, which means that value will be created, captured, delivered, received and consumed. Obviously much can go wrong or not happen in the value flow process. The value flow process depends on many things equivalent to the nutrient cycle and “energy flow” in a biological ecosystem, the electricity flow in an electrical system, the heating flow in a heating system as analogical examples. In BMES BMI motivation, trust, ownership, technology, people, organizational systems and culture as examples influence if value flow and value exchange will and can take place. Relation mapping (Amidon 2008, Russels 2012) can help us to understand better and show which BM’s and BMES carry out which value flow. It can also show how values are exchanged (Alee 2011) between BM’s – and both tangible and intangible values.

Relations between BM’s and BMES can be both tangible and intangible – and therefore it can be rather complex to study and map BM and BMES value flow, connections of tangible and intangible relations – analogically as to what nutrient cycles and energy flows study can be. Mapping of relations in and between BMES can be even more complex when culture and spirit dimensions are also taken into consideration (Saghaug 2010).

The motivation and incitements in BMES and between BMES to relate have until now not been addressed in particular in research (Lindgren 2014) – but it can be studied through the value flows, value transaction and value network mapping in Business Model Innovation (BMI). Our hypothese is that there can be more sources to motivation to relate.

To motivate – or trigger a BMI flow – and a valuable BMI flow – it is necessary and vital to any BMES to exchange value through relations and hereby enable the fundament to all BMI – learning process (Caffyn 2003) – in the BMES. It is important – and vital to BMES and BM’s that knowledge flow and learning loops happen in BMES and between BMES. Any BMES can advantage from “value adding” knowledge and opposite can suffer from “none

value adding” knowledge or even not receiving value adding knowledge. Learning and motivation to learn is therefore a basic fundament for any BMI (Lindgren 2014) – Learning is fundamental for any BMI. Motivation to learn is therefore an important trigger or driver to commence a value flow and value exchange.

Energy, water, nitrogen and soil minerals are essential abiotic components of any ecosystem. Analogically, Competences (Technology, Human resource, organizational systems and culture) (Lindgren 2010) embedded in BMES BM's are essential components of any BMES. Competences can be developed and grow – but can also be diminish, shrink and even vanish in a BMES. Competence (Technology, Human resource, organizational system and culture) can simply disappear or leave the BMES as value flow out – production leaves a BMES (the como silk cluster) but also as value flow in to the BMES – (The silicon valley case).

Value that flow into the BMES can however also destroy built up competences inside the BMES and its BMS. We found in our research that both value that flow out and value that flow in can be one of the important reasons to why some BMES shrink, collapse and even disappear (Windmill, textile and furniture BMES).

The reasons to why competence leaves BM's and BMES can be many. One reason could be that competence are forced to leave – Western production in textile, furniture, windmill production and many other industries have left to Asia due to a motivation and perception in the businesses involved of lower production cost, access to new markets and maybe a perception of the possibility to create a better value formula. Hereby the western production in these BMES slowly vanish as they transferred their competences – technology, HR, organizational system and culture to e.g. Asia. A “single loop” or a “one way” value flow transferred from one BMES to another BMES.

However these cases do obviously not increase learning and BMI in the BMES giving away and sharing value with other BMES – in this case valuable competences. “Double loop” value flow can oppositely – if the receivers of the value are able to capture, receive, consume and create new knowledge and deliver value back to the BMES – enable competence development in the first BMES. A BMES can hereby work as a competence-adding mechanism but also opposite – either by just giving away value and competences or by developing new value and new competences and sharing these with other BMES. BMES survival is strongly tied to the capability to continually develop and improve competences – by learning and attracting new value.

Competence of a BMES – the sum of all the BMES BM’s competences – therefore makes BMES more or less attractive and thereby vulnerable. Competence is therefore without question a vital dimension (Prahalad 1990) in any BMES – however often paradoxical – still a neglected dimension. Many European and Asian BMES want e.g. to learn from “the Silicon Valley BMES” competences – learn – How to innovate new BM’s and Business? e.g. as Google, Facebook, Apple and Twitter and How to become sustainable BMES?. We believe that continuously learning and knowledge sharing together with motivation to learn from other BMES are probably important secrets and essentials to the success of “The Silicon Valley BMES”. Silicon Valley has understood the important to relate and attract other BMES or knowledge zones to relate (Amidon 2008).

3.2 “Energy” of Business Model Ecosystems

Living Eco systems – also BMES – require energy to stay alive. BMES require available energy to stay alive, grow and even be born. Energy can be stored in the competences of the BMES BM’s- or in other BMES BM’s – they “only” have to be released (Lindgren 2013).

BMES require knowledge on how to release the energy stored in the competences of BMES BM’s. Oil industry has the competence (technology, HR, organizational systems and culture) to release oil from “deep under” – but they also have the knowledge inside the BMES to know how to release the oil. The knowledge – How to – is embedded in their BMES competences. If the knowledge – How to? – was nonexistence in the BMES – the oil could not be “brought up” or it had to be “brought up” by other BMES from outside.

The earth receives energy from the geothermal energy contained within the earth. The Earth is sensitive to changes in the amount of energy received. Energy is value to the earth – but also to any other BMES. BMES receives value from other BMES – visible or invisible – and develop on behalf of this energy – sometimes in interaction with other BMES BM’s. BMES develops however also energy via the interaction between BM’s inside the BMES. We propose that biological ecosystem and BMES very much function related to energy development much the same.

Energy are stored also in the competences of other BMES BM’s. Living Ecosystems like e.g. the Earth receives energy from the sun – some would say an Ecosystem outside the earth’s ecosystem others would increase the

earth's ecosystem to also include the sun. We propose this discussion to be context based related to BMES as they can receive energy from other BMES – but the judgement to this is related to who “sees” and from which viewpoint.

There is however different forms of energy. Common energy forms according to (Chapin 2002) include the **kinetic energy** of a moving object. The **radiant energy** carried by light and other electromagnetic radiation, the **potential energy** stored by virtue of the position of an object in a forced field such as a gravitational, electric or magnetic field, and the **thermal energy** – comprising the microscopic **kinetic** and **potential energies** of the disordered motions of the particles making up matter. Some specific forms of potential energy include **elastic energy** due to the stretching or deformation of solid objects and **chemical energy** such as is released when a fuel burns. Any object that has mass when stationary, such as a piece of ordinary matter, is said to have rest mass, or an equivalent amount of energy whose form is called **rest energy**, though this isn't immediately apparent in everyday phenomena described by classical physics.

We propose that BMES also have or develop different forms of energy – however this we have not researched yet and defined terminological.

Our Sun transforms nuclear potential energy to other forms of energy; its total mass does not decrease due to that in itself (since it still contains the same total energy even if in different forms), but its mass does decrease when the energy escapes out to its surroundings, largely as radiant energy. Hereby eventually someday – the sun will stop to shine and transform value and energy to its surroundings. BMES and BM's also transform potential energy – value and competences – to other forms of energy – value and competences. The total “mass” of a BMES or a BM as a result of the value transformation flow do neither reduce its “mass” but as in an ecosystem or in the case with the sun BMES and BM's mass does decrease when value or competences escapes out to other BMES or BM's – “single loop” value and competence flow – except when the BMES and its BM's receives value and energy from BMES outside.

Although any energy in any single form can be transformed into another form, the law of conservation of energy states that the total energy of a system can only change if energy is transferred into or out of the system. This means that it is impossible to create or destroy energy. Any competence in any single form – technology, human, organizational system and culture can be transformed into another form – inside the BM's, into other internal

BM's in the BMES or outside to other BM's in other BMES. This also means that in BMES it is also impossible to destroy value and competences – but value and competences can vanish to other BM's and BMES – or as we have seen in several of our cases in our researches (NewGibm case research 2006, Blue Ocean case research 2008, WIB 2012, ICI Case research 2013, NEFFICS 2013, SET cases 2014, EV Metal 2014), it can rest as hidden values and competences (Lindgren and Saughaug 2012) inside a BM or a BMES.

4 Introduction to the Business Model ECO SYSTEM (BMES)

Today, the term 'business model' is everyday and everybody's language in business, and of business model academia's. The increased awareness of BMs (Magretta 2002, Osterwalder 2002, Johnson 2008, Chesbrough 2010, Zott 2010, Teece 2010, Casadesus-Masanell 2010, Osterwalder 2011, Krcmar 2011) have intensified the search for a generic business model language. However, with increased use and research of BM the fuzziness on how the BM really is constructed and defined has increased even more. Everybody seems to have their language and terminology – and academicians still lack's to agree on a common language and terminology (Teece 2010).

The focus in this paper is however not on the BM but on the BMES and the dimensions and construction of BMES which any BM's are a part of. Although this is not sufficient to cover the whole BMES theory framework approach as it is just one focus of probably many viewpoints of BMES it is an attempt to describe a fragmented part of the whole business model environment, research and discussion.

Today, the focus of the BM seems to be changing and shifting towards a more holistic BM discussion taking in the BM's relations to other BMs and the BM's environment – leaving the basic BM dimensions and constructions behind although it has not completely been defined.

In this paper we try to find the dimensions and components of BMES that everybody seems to acknowledge and add those we believe are missing. We try to merge those dimensions, which are overlapping and we try to take out those dimensions that are not vital for BMES. From this point of entry, we test our BMES dimensions in four BMES case studies to verify empirically our hypotheses of the existence of seven dimensions of any BMES.

5 Dimensions, Concepts and Language of a Business Model ECO SYSTEMS (BMES)

From acknowledged academic works and our research work with the dimension of a Business Model and business, we found some generic dimensions that support the idea that any BMES could be defined by 7 generic dimensions.

5.1 Value Proposition Dimension of a BMES

All BMES we investigated (Appendix 1) offers values to either BM's inside the BMES and/or to BM's outside the BMES. The BMES value proposition seems to be a "mirror" of the BM'S value propositions individually and together inside the BMES. We define these as the BMES value proposition offered to other BM's either offered as one BM's to another or more BM's together as a shared value proposition of the BMES. Value propositions from a BMES can be offered in the form of products, services and/or process of services and products.

5.2 Customers and/or User Dimension of a BMES

BMES serves customers or/and users (Appendix 1).

"A successful BMES is one that has found a way to create, capture, deliver, receive and consume value for its users and customers – that has found "a way" to help customers and users of a BMES to get an important job done – "solve pains" and "create gains" for its "users" and "customers". "It's not possible to invent or reinvent a BMES without first identifying a clear customer and/or user base".

Here, we draw a distinction between customers and users to a BMES. Customers to the BMES pay with money – *"there is no BMES marked – Business of a BMES – if the customers of a BMES do not pay"* (Kotler 1983), whereas users to a BMES pay with other values (von Hippel 2005) than money. Business Model theory (Appendix 1) has mainly considered the business model related to customers. However, as we have verified in our research (Lindgren 2013) users can be highly valuable to BMES by "paying" with other values (Facebook, Google). Industry, sector and clusters mostly focus on money but do also consider other values as payment to a BMES.

5.3 Value Chain Functions [Internal Part] Dimension

Any operating BMES has functions that it has to carry out and which enables the BMES to “offer” the value propositions to its customers and users. A value chain function list including primary and secondary functions of a BMES can be listed. Primary functions can be – inbound logistics, operation, out bound logistics, marketing and sales, service – and secondary functions – support functions – procurement, human resource management, administration and finance infrastructure, business model ecosystem innovation can be carried out – but do not have to be present and carried out all to have the BMES operating.

Any operating BMES needs to have someone to carry out these functions to enable a BMES to create, capture, deliver, receive and consume value proposition to and from its users, customers and network. Either these can be carried out by its own users, customers, competence and network or it can be carried out by other BMES.

5.4 Competences Dimension

In BM’s we have earlier (Lindgren 2013) inspired by Prahalad and Hammel (Prahalad 1990) divided competences in to four groups – technology, human resource, organizational system and culture. In a BMES we consider also the competence dimension to be technology, human resource, organizational system and culture with the different BM’s “pooling” their competences. The pool of these competences forms the “shared competences” available in the BMES.

5.5 Network Dimension

We acknowledge that some BMES sometimes regard themselves as isolate to other BMES or do not relate to other BMES. We argue that any BMES either they want it or not are in a network of BMES – and these networks of BMES’s can either be physical, digital or/and virtual (Child and Faulkner 1998, Child and Faulner 2005, Goldmann 1998, Winston 2003, Vervest 2005, Lindgren 2011). We found that most “successful BMES” is those that has found a way to create value for its network of BMES – that has found “a way” to help network of BMES or/and to get an important job done for the network of BMES.

Some BMES mention or express openly their network of BMES on which they live and collaborate with – others do not. Many BMES do not understand

and often do not acknowledge value which they receive from other BMES before it is too late and they are in risk of vanishing, being punished or restricted.

5.6 Relation Dimension

Business models are related through tangible and intangible relations inspired by (Provan 1983, Provan 2007, Provan 2008, Alee 2011) to other business models inspired by (Håkonson 1990, Amidon 2008, Russels 2012, Lindgren 2013). Businesses are related through strong and weak ties inspired by (Granovetter 1973). As BMES are a construction of BM's it seems also obvious that these are to be related through tangible and intangible relations – and also with strong and weak ties. BMES send value propositions to other BMES through relations and receive value propositions from other BMES through relations. Relations can be one to one or one to many. Relations can be visible and invisible to humans or machines (Lindgren 2012). Tangible and intangible relations are used in the BMES to deliver and receive values (Alee 2011). BMES relate their BM's value proposition, users/customers, value chain functions, competences and network through relations. Relations are used for creating, capturing, delivering, receiving and consuming values.

5.7 Value Formula Dimension

Any BMES uses some kind of a formula to calculate the value it offers to the BMES or other BMES. The value formula is a formula that shows how the value proposition delivered are calculated by the BMES. The result of this calculation is a value formulae either expressed in money or/and other values.

Several have documented that BMES operates and is influenced by its BMES environment – external environment factors. In this paper, we leave out these external environment factors – political, economic, social, technical, environmental, legal (PESTEL 2007) conditions and competitive contexts and environment dimensions for further comments acknowledging that the BMES external environment is important and critical to any BMES survival and growth. However we believe that these environmental factors are outputs from other BMES.

The above mentioned seven dimensions are equivalent to the overall model we propose to how any business and business model is constructed (Lindgren 2013). The seven dimensions we propose should also be considered by any

BMES. However, there is a difference between the way businesses want to run their operations in a BMES – seven visionary dimensions of a business and how a business really runs its operations in a BMES. By mapping empirical data from our BMES case studies to the seven dimensions, we found that business run their BM's differently in BMES and most businesses have more than one BM in a BMES. In other words, the businesses they described via the seven dimensions are different to how they actually run their business models in the BMES. Some of these business models were close to their original description of the seven dimensions but others were different. This often challenges the survival and growth of a BMES – but it also drives the development, organizational system, culture and vitality of a BMES. If more Business begin to run their BM's not in “sink” with the BMES overall vision, mission and goals of the 7 dimensions then the BMES can be challenge and eventually be disrupted, torn apart and vanish.

This places our attention to the “download”, “see” and “sense” approach to BMES in the perspective that BMES have more BM's that are different. We address the importance of continuously investigation BMES and their BM's and innovation of BMES to “picture” the distinction between the “visionary model” of the BMES and the BM's of business that are actually carried out (“AS IS” BM) and are intended to be carried out (“TO BE” BM) in the BMES. Herein we believe lays the “seed” to BMES survival as if they are not “in sink” then the BMES eventually is in risk of falling apart and maybe vanish.

This observation together with inspiration from Abell's and Hamel' original definitions and framework of “The core Business” (Abell 1983), “The core competence” (Hamel 1995) made us to draw an analogy to the definition of “the BMES” as the BMES context – and visionary level states how BMES are related to the seven above mentioned dimensions.

The core of the BMES refers therefore in this perspective to:

“How a BMES are constructed and intends to operate its “main” and “essential” business related to the seven BMES dimensions – value proposition, user and/or customer groups, value chain [internal functions], competence, network, relations and value formula.”

In this context we acknowledge that some BMES operates without a vision, strategy or intention – or these evolves as the BMES grow, live and dies.

In our research, we found that many BMES do not stick strictly to their core business and how they was meant or intended to run and be. They have in fact a variety and a mix of BM's which sometimes have different

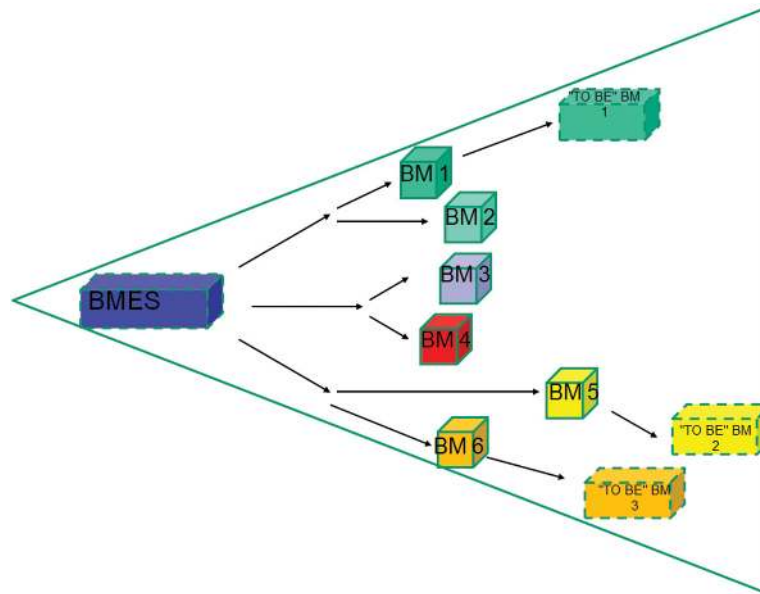


Figure 3 The multi business model approach related to a BMES.

value propositions, users and customers, value chains with different functions, competences, network, relations and value formulas- they cross “the borders” of “the core BMES”. One set of dimensions of a BMES do not always fit all BM’s and businesses. These mix of dimensions – which we classify as different BM’s exist and coexist within the core business of the BMES – what we call BMs inside the business – but also exists and coexists outside the BMES. Individual BMs are not necessarily aligned strictly or do not have to be aligned to the core business model of the BMES and the seven dimensions of the BMES.

We argue therefore that a BMES different BM’s cannot be explained by just one BM’s – “the core business model” of the BMES – but would with preference be better to be explained by different BM’s in the BMES – however, still each with seven dimensions, but with different characteristics. In our research, we found many examples of different BM’s operating in a BMES, which indicates the existence of more BMs in a BMES.

As a consequence, we propose that any BMES can be said to have more BMs offered by different businesses – the multi-business model approach (Lindgren 2011) – which are more, less or not aligned with “the core business model” of a BMES. However, any of these BMs can be defined as related to

Table 1 Generic dimensions of a BMES

Core Dimensions in a BMES	Core Questions Related to Dimensions in a BMES
Value proposition/s (products, services and processes) that the BMES offers (Physical, Digital, Virtual)	What value propositions do the BMES provide?
Customer/s and Users that the BMES serves – geographies, physical, digital, virtual).	Who do the BMES serve?
Value chain functions [internal]. (physical, digital, virtual)	What value chain functions do the BMES provide?
Competences (technologies, HR, organizational system, culture) (Physical, digital, Virtual)	What are the BMES competences?
Network – Network and Network partners (strategic partners, suppliers and others (Physical, digital, virtual)	What are the BMES networks?
Relations(s) e.g. physical, digital and virtual relations	What are the BMES relations?
Value formula (Profit formulae and other value formulae. (physical, digital, virtual)	What are the BMES value formulae?

an overall generic BMES BM consisting of seven generic dimensions. Each of the seven dimensions of a BMES addresses some core questions in relation to each individual BMES's dimensions characteristics and logic.

6 The BMES BM's Dimensions and Component Level

Each BMES can be divided into different dimensions and components. We now exemplify the BMES dimensions and components by explaining firstly how each dimension and component in any BMES can be different and how they can be characterized on a BMES dimension and component level.

6.1 The Value Proposition Dimension and Component Level of a BMES – What Value Propositions Do the BMES Provide? – (VP)

BM's is key in understanding the value of BMES "offered" in a BMES. However, BM's varies in the BMES related to their different BM's dimensions – value proposition, users, customers ... – The BMES's value proposition is often very complex to understand in detail because it is not static but dynamic over time. BMES value proposition is also complex to understand because it is often a mix of shared value propositions offered by more BM's. Therefore, BMES value proposition has to be understood from different perspectives



Figure 4 The value proposition dimension of a BMES.

e.g. of the BMES customer and/or user it is servicing, its networkpartners, by the context the BMES deliver its value proposition in, the time the BMES delivered its value proposition and the “place” value proposition is offered by the BMES – (physical, digital or virtual place). BMES can be said to be closely connected to the concept of “the BMES total value and cost to its users, customer and network partners”. In this case, staying at the point of entry to a BMES or the value proposition process over time of a BMES is strongly related to the users, customer’s and network partners total perceived value and total perceived cost related to the value proposition offered by the BMES. This is why it is incredibly difficult as one from outside to measure, read the values and cost of a BMES and how the users, customer and network partners value it, and decide the degree of attractiveness of a BMES.

To classify value proposition of BMES is often different to each **user, customer, network over context, time and place.**

Inspired by Payne and Holt (1999) we outline four types of values related to values proposed by a BMES.

1. **Use Values** – the properties and qualities, which accomplish a use, work, or service for the users, customers and network.
2. **Esteem Value** – the properties, features, or attractiveness, which causes a want to own the product, service and processes of the users, customers and network **Cost Value** – the sum of labor, materials, and various other cost required to produce value for the users, customers and network.
3. **Exchange Value** – its properties or qualities, which enable exchanging value proposition for something else that the users, customers and network wants.

We found that the list of types of values of BMES that solves “the pains and gains” (Osterwalder 2014) of BMES users, customers, network – has to be complemented by an overall dimension of the BMES work time vs. lifetime (Fogh Kirkeby, 2000, 2003). Time as the factor that is defining BMES’s users,

customers and network personal or BM'S values of being part of the BMES – the e.g. trade or process related to an overall lifetime value perspective of the BMES and describes the sum of actions taken in order to find work life-fulfilling and transcend the BM's, a value often seen as the driver of the BMES inspired by (Tillich 1951, Austin 2004, Sandberg 2007).

Valueproposition of a BMES has to be measured **before, under** and **after** the BMES exist. This means that a BMES users, customer and network could trade or collaborate on the different value and cost the BMES offer but also from the value of the relationship that exist in the BMES and between BMES. The creation, capturing, delivering, receiving and consumption of values from BMES through its relations are the value creation, capturing, delivery, recievement and consumption of an “inter-Business Model organizational collaboration business” – a network-based BM business. This is one important value and also an attraction factor, which could be in this case, a BMI of a “TO BE” BMES – when existing BMES BM's is not enough. The value formula of this can be money to the BM's participating in the BMES (App store Apple, You Tube, Food Tech 2014 Fair, Roskilde Rock Festival), but it could also be other values e.g. learning, supporting a vision, a case (Green Peace, Red Cross, Political Party) This is in line with research claiming that the value of relationship, activity links, resource ties, and actor's bonds (Axelsson and Easton, 1992; Håkonsson, 1982; Håkonsson and Snehota, 1995; Ford et al., 2001, 2002, 2003) can be even more important than the value – money for products or services of a BMES. The value of the relationship of a BMES is both an input but also an output of the BMES and BMES innovation process, which supports the argument, that value and cost of a BMES is not static but dynamic.

As values are created, captured, delivered, received and consumed in a value process in the BMES, BMES are continuously undergoing change throughout the BMI process or the life time of a BMES. Values and cost of BMES relations can be related directly (e.g. profit-, volume-, safeguard-functions) but also indirectly (e.g. innovation-, market-, scout-, access-functions). The value and cost functions (can further be of a low and/or high performing character which is often up to the user, customer and network partners judgment and to influence the degree of this value and cost.

The value and cost of a BMES should also be understood as perceived value – benefits and cost (Woodroff, 1997; Walter, 2001; Lindgren, 2002), which means that the real value of BMES can in some cases be neglected in advance to a higher or lower perceived value of the BMES Value proposition.

Furthermore, perceived value should not just be related only to each individual BM's in the BMES but also to groups of BM's in the BMES – what we proposed to be called the portfolio level of a BMES. Therefore, it is the user's, customer's, competencies, network's interpretation of “value” and “cost” that is important and not just what “the business of the BMES”, its stakeholders (investors, the industry, sector, cluster), society and other think ought to be or are the values and cost of a BMES.

It is therefore very complex – when analyzing and understanding a BMES product, service and/or process of value proposition, to analyze all BM's and stakeholders values, costs, perceived values and costs of a BMES. Furthermore, it is however important to analyze these over time, during trades or inter BMES collaborative process, as values and cost are dynamic and will therefore by definitions always change throughout the entire value and cost innovation process and thereby over time. Today no industry, sector and cluster framework has managed and is able to cover and capture value and cost change over time – and seen from different viewpoints. The holistic picture of a BMES value proposition is still very blurred and very complex “to see” but opens up to a whole new way of viewing value contrary to the market, industry and cluster approach.

In summary, any BMES may offer a value proposition which can be offered as tangible and/or intangible value. Value proposition from a BMES can be expressed in value propositions but also in the values of relations. In fact values of a BMES can be seen as least form 7 different view points, which we will later on comment to in our next research contribution.

6.2 Customers and Users Dimension of a BMES – Who Does the BMES Serve? – (CU)

Any BMES that we researched has users and customers. However, we found that many BMESs do not have customers that pay for the BMES's value proposition. Several BMES are “just” constructed around users – maybe for

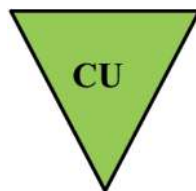


Figure 5 The customer and user dimension of a BMES.

a very limit time and a limit topic (Brent Spar Shell (Brent Spar 2014)), which provides the foundation for the BMES or even for other BMES with customers related to the BMES – Sponsorship, membership, likes, referrals. Facebook, Skype, Linkin, Twitter and Google could be examples of such BMES. This indicates that a complete mapping of the BMES BM's can be extremely difficult to establish – also because our research shows that BM's in different BMES can be users and customers to the BMES in focus at the same time – but in very different contexts.

Our research showed that BMESs built upon users, when growing big in numbers of users, can attract and activate customers from other BMES willing to buy – or pay for value propositions in BMs in the BMES (Facebook, Skype, Linkin, Twitter and Google as examples again). Either users start to pay for better performance, advanced use, deeper content e.g. or other customers from other BMES buy e.g. promotion, data, analytics because there are so many and valuable users in the BM. In these cases, the customers pay for other or different value propositions – or a different BM – as e.g. access to, knowledge and learning about the users in the BMES are attractive. Stock buyers placed in a different BMES to Facebook and Alibaba.com BMES could be an example of this.

6.3 Value Chain Functions [Internal] Dimension in BMES – What Value Chain Functions Do the BMES Have? – (VC)

Any BMES carry out certain functions to produce the value proposition to the users, and/or customers and network partners. Porter's Value Chain framework was related to an operating Business. However, when BMES commence to create a "TO BE" BMES there are really no active activities, just wish and expectation of value chain functions the BMES should carry out. Further, when we observe an operating BMES at a certain moment – in this case, we freeze the picture of a specific BMES – we do not see "running" functions

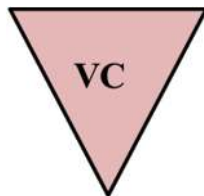


Figure 6 The Value Chain function dimension in BMES.

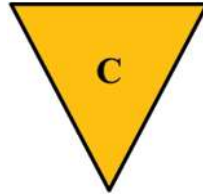


Figure 7 The competence dimension of a BMES.

but just functions that are carried out. Value chain functions in our BMES framework represent the value chain functions that have to be carried out or are being carried out within the BMES – Internal value chain functions in the BMES. We acknowledge that there are value chain functions outside the BMES but in our framework we here only focus on the internal value Chain functions of the BM.

6.4 Competence Dimension – What Are the BMES Competences? – (C)

Any BMES rely on and use competences, either from the focal BMES, from BMES network partners or even from BMES customers and users to carry out the value chain functions to be able to create, capture, deliver, receive and consume the value propositions of the BMES. According to Prahalad and Hammel, (Prahalad 1990) competences can be divided to four main categories according to Prahalad and Hammel Technologies, HR, Organizational Structure and culture.

Technologies according to a BMES we divided into

1. Product- and service-technologies of a BMES
2. Production technology – both “Product- and Service-production technologies” of a BMES
3. Process technology – process technologies that runs and steers the production technologies so that the product, service and production technologies can created, captured, delivered, received and consumed the valuepropostions of the BMES

Each BMES has a specific mix, integration and use of product- and service-technologies, production technologies and process technologies. Some mix, integration and use of technologies are so unique to the BMES that the competence can be a core competence of a BMES related to other BMES.

Human Resources are “the people” of the BMES placed in the BM’s in the BMES.

Organizational system is the organizational system that the BMES use to organize the use of BMES technologies, human resource and culture to carry out the Value Chain functions.

Culture is the “soft” part of the competence dimension. We claim that any BMES has a specific culture.

6.5 Network – What Are the BMES’s Network?

No BMES is a lonely island – at least not for very long time. Why? – because if a BMES does not receive value from outside our research shows that it will slowly shrink and vanish. If it does not offer a value proposition of any kind to other BMES it will not be able to receive value in a long time perspective. The BMES network hereby becomes vital to any BMES.

6.6 Relations Dimension – What Are the BMES Relations? – (R)

Any BMES relies on relations between BM’s inside the BMES. In our research, we however found four sets of relations that are of importance to BMES’s and should be attended to.

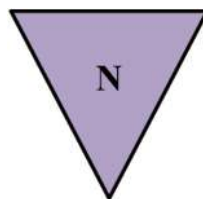


Figure 8 The network dimension of a BMES.



Figure 9 The relation dimension of a BMES.

1. The “**inside BMES inside BM’s**” area relations – Business model relations transferring values inside the BMES BM’s.
2. The “**inside BMES outside BM’s**” area refers to relations between different BMs inside the BMES.
3. The “**Inside BMES outside BMES**” refers to relations between BMES’s BM’s outside of the BMES.
4. The “**Outside BMES Outside BMES**” refers to relations and relation area where the BMES do not share a relation to BMES that are different.

Valuepropositions and competences of a BMES can be seen in many perspectives as shown in Figure 10. Value proposition from a BMES can not only be related to products, services and processes of the BMES but also strongly connected to the relations and thereby a result of the relation between BMES Relations, activity links, resource ties, and actor’s bonds (Axelsson and Easton, 1992; Håkonsson, 1982; Håkonsson and Snehota, 1995; Day 2000; Ford et al., 2003) are all tools which can be used to describe and map relations to and in BMES.

The creation, capturing, delivering, receiving and consumption of value in a BMES is enabled through these relations (Lindgren 2012). Relations connect the different BMES BM dimensions’ components and enable the creation,

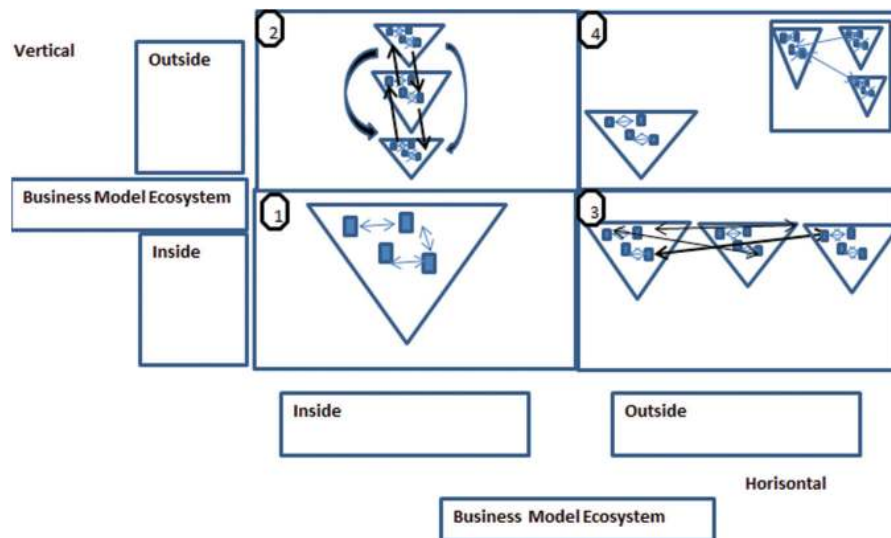


Figure 10 The relations areas related to a BMES – The BMES relation axiom Lindgren and Horn Rasmussen 2015.

capturing, delivering, receiving and consumption process of value. However, if a BMES is not able or willing to relate and later send and receive value through relations, then the relation has no value, no task – and gives obvious no meaning and value to a BMES.

6.7 Value Formula Dimension Component Level – What Are the BMES’s Value Formulae? – (VF)

Any BMES will have one or more value formulae, which can be expressed in either a monetary and/or in a nonmonetary value formulae. We found that the term profit formula is too narrow a terminology to express the formula by which BMES calculates the value formulae of a BMES. Our research showed that many BMES and their BM’S are not focused, or better are not exclusively focused on profit but instead on other value formulae of the BMES. They “calculate” on other value formulae and to get a full understanding of why BMES exist and are innovated it is definitely relate to understanding BMES necessary to include other value formulas. We propose profit formula as one of many value formulae that can be the “calculated” output of a BMES. However, we claim that any BMES has one or more calculated value formulae – monetary and/or non-monetary. A BMES can have more than one value formulae.

Having proposed that the seven dimensions of the BMES exists, it enables us to complete the concept and picture of the generic BMES.

However, we discovered that the seven dimensions form a BMES cube with the “IN IN” relations inside the BMES as shown in a sketch model in the figure beneath.

The 2D version is very helpful when working on a BMES dimension level and a 3D version would be helpful when working on a BMES’s in a BMES relation axiom level. Both presentations would be helpful when working on BMI of BMES.

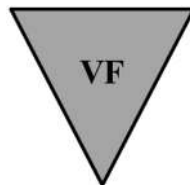


Figure 11 The value formula dimension of a BMES.

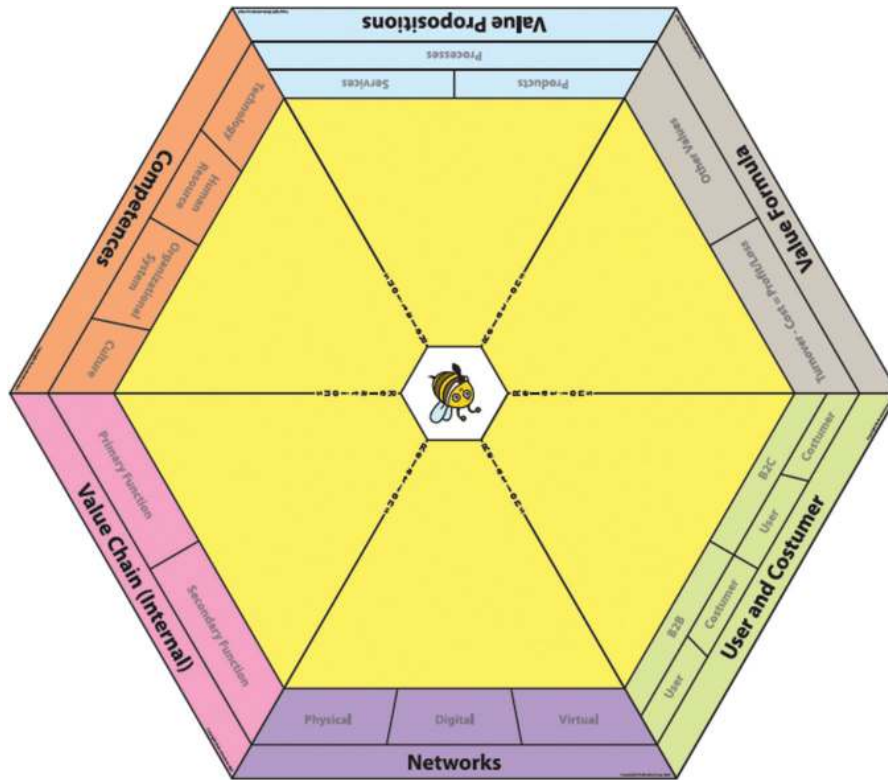


Figure 12 The seven dimensions of the BMES.



Figure 13 The seven dimensions of a business model eco system presentation.

7 The BMES Cases

7.1 CASE 1 – Danish Energy BMES

The Danish energy market can be considered in a certain context as a BMES. Oil (Mærsk, Statoil, ELF, Shell, Dong, Q8, OK, ...), coal (Dong, Neas, ...), gas (Dong, Praxair, Kosan ...), biogas (EON, Blue Planet, Maabjerg..), solar (Dansk Sol Energy, ..., ..) and electricity from windmill (Dong Energy, Watenfall, Neas) are considered as major energy forms in the Danish

Energy BMES. As can be seen different business operates in the BMES and even some business operates with more than one BM in th BMES (Dong, Shell EON, . . .).

Denmark has considerable sources of fossil energy – oil and gas from the North Sea The production of oil fell from 523 PJ in 2010 to 470 PJ in 2011. Consumption of oil fell from 315 to 306 PJ (Dansk Statistik 2012). Denmark expects to be self-sufficient with oil until 2050. The production of natural gas fell from 307 PJ in 2010 to 265 PJ in 2014. Consumption fell from 187 to 157 PJ. However, gas resources are expected to decline and production may decline below consumption in 2020, making imports necessary. Politically there is a major wish exchange natural gas (“black gas”) with Biogas but until now Biogas only takes 3% of total gas consumption in 2014 (DWI 2014). The Danish government have announced that the aim is to have “black gas” exchanged by more “green gas” so that Denmark can save more CO₂ and become more independent of fossil gas (Danish Ministry of Climate and Energy 2011). Business that operate in the Biogas market today is several private biogas producers together with e.g. EON, HMN, . . .

A large proportion of electricity is still produced from coal but a growing part by wind turbines, which meet about 39% of electricity demand in Denmark by 2014 (see Wind power in Denmark). To encourage investment in wind power, families – (customers) were offered a tax exemption for generating their own electricity within their own or an adjoining commune. While this could involve purchasing a turbine outright, more often families purchased shares in wind turbine cooperatives which in turn invested in community wind turbines. By 2004 over 150,000 Danes were either members of cooperatives or owned turbines, and about 5,500 turbines had been installed, although with greater private sector involvement the proportion owned by cooperatives had fallen to 75%.

In February 2011 – the “Energy Strategy 2050” was announced by the Danish government with the aim to have Denmark become fully independent of fossil fuels by 2050 (Danish Ministry of Climate and Energy 2011). The Danish government target is to have 50% wind power in the electricity system by 2020 – a major change in the relative balance between energy sources in the Danish BMES.

Denmark’s electrical grid is however connected by transmission lines to other European countries (Other BMES) – Norway, Sweden, UK and Germany and has hereby according to the World Economic Forum the best energy security in the EU – but are also heavily influenced by these BMES. Beneath a description and analysis of the Danish Energy BMES are presented.

Table 2 Fossil fuel consumption in Denmark

Energy in Denmark						
Year	Capita (Million)	Prim. Energy (TWh)	Production (TWh)	Export (TWh)	Electricity (TWh)	CO ₂ -Emission (Mt)
2004	5.40	233	361	117	35.8	50.9
2007	5.46	229	314	64	36.4	50.5
2008	5.49	221	309	54	35.5	48.4
2009	5.52	216	278	43	34.5	46.8
2010	5.55	224	271	42	35.1	47.0
2012	5.57	209	244	19	34.1	41.7
2013						
2014						
change						
2004 to 2014	+3.7%	-10%	-32%	-84%	-4.7%	-18%

Coal power provided 48.0% of the electricity and 22.0% of the heat in district heating in Denmark in 2008; and in total provided 21.6% of total energy consumption (187PJ out of 864PJ) and is based mainly on coal imported from outside Europe (other BMES) Business Operating in this market is primarily DONG ENERGY, Watenfall and some few more).

Denmark has also two geothermal district heating plants, one in Thisted started in 1988, and one in Copenhagen operating from 2005. They produce no electricity.

Denmark already reached its year 2020 governmental goal of installing 200 MW of photovoltaic capacity in 2012. As of 2013, the total PV capacity from 90,000 private installations amounts to 500 MW. Danish energy sector players estimate that this development will result in 1,000 MW by 2020 and 3,400 MW by 2030. Business that operate in the Biogas market today is several private biogas producers together with e.g. EON, HMN.

In the model of the Danish Energy BMES (DEB) it is possible to see registered operating business models.

7.2 Case 2 – Danish Renewable Energy BMES

The Danish energy BME could also be seen in another context where the focus is just on the renewable energy BMES. The renewable energy BMES in Denmark consist of electricity from windmills (Dong, Watenfall, Neas), solar energy (Dansk Solenergy,.. (Energy Midt, private households, ...), Biogas (Eon, Sydenergi, ...), geothermal energy (Thisted Termical Energy, ...), Blue energy based on alga (Blue Energy, Folum ...).

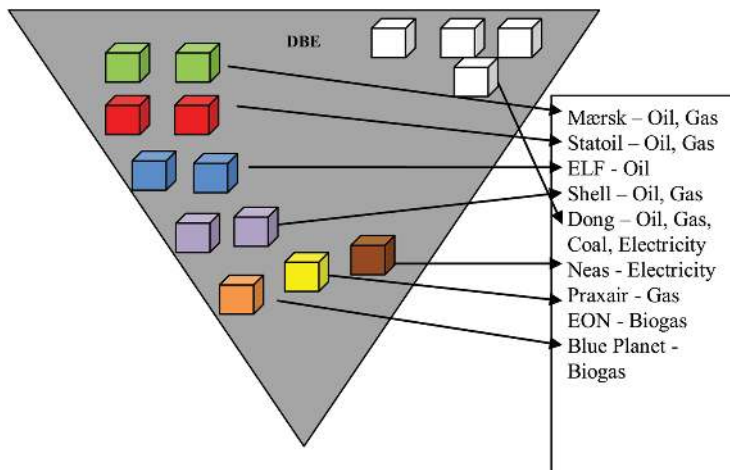


Figure 14 Danish energy BMES with elected BM's of operating businesses.

The market volume of the BMES for renewable energy in Denmark is of course smaller than the total energy BMES in Denmark. Further some of the minor business models in the energy BMES suddenly becomes bigger and even large players if we change the context to now only considering the renewable energy BMES.

Also interesting is that the numbers of “TO BE” BM's and the degree of innovation increase in the renewable energy BMES compared to Energy

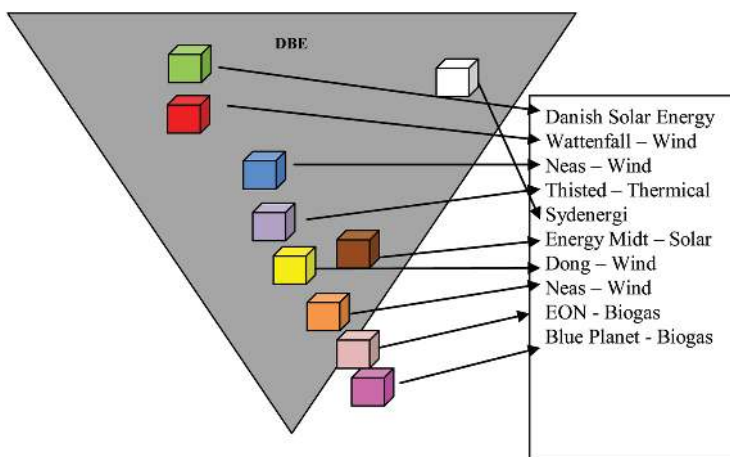


Figure 15 Renewable energy BMES in Denmark.

BMES. Some Universities and GTS institutions are now actors in the BMES with different value formula than money – namely research and learning as focus. Also several municipalities, regions (Denmark is divided into 5 regions) and even the state government are now actors and even investors in the BMES due to political and renewable energy based value formulas dictated from BMES outside e.g. EU.

7.3 Case 3 Suppliers to Danish Energy Production BMES

The Danish Energy BMES has a tremendous amount of suppliers in both Denmark and other European countries. Beneath we mentioned some of these different BMES seen in different context.

1. Oil BMES – Mærsk, Dong, Shell, Statoil, . . . , . . . ,
2. GAS BMES – Kosan, Praxair, EV Metalværk,
3. Wind Mill BMES – Liftra, AH Industries, Nordmark, Siemens, Vestas, Niebuhr, KK Electronics, DEIF, DSV,
4. BIO Gas BMES – Orbicon, Jenbacher, Gas2move,
5. Solar BMES – Danish Solar Energy, Nordisk Solar, . . .
6. Termical Energy – Thisted Termical
7. Blue Energy – Foulum

In the Figures 16 and 17 beneath we show some elected vertical and horizontal BMES.

7.4 Case 4 – HI – BMES to Danish Energy BMES and Other BMES

MCH is one of Scandinavians largest and most flexible amusement centers with over 900,000 visitors each year. MCH has 4 BM portfolios – The Fair center Herning, MCH Herning Congrescenter, MCH Arena and Jyske Bank BOXEN. MCH has the competence to provide meetings for 15 people, congres for 2,000 participants, football matches and arena for 11,000 spectators and fairs up to 50,000 guests. MCH competence is to provide BM's and BM Eco systems where amusements, business model exchange are core. Amusements can be a broad spectrum – rock, teater, musicals and big sportsevents. MCH host and set up more than 500 arrangements pr. year and is one market leader in setting up BM Ecosystem of amusement. MCH competence are professionel and serviceminded employess, topmodern facilities. Unique experience and facilitating people and technology to meet each other is MCH's core competence.

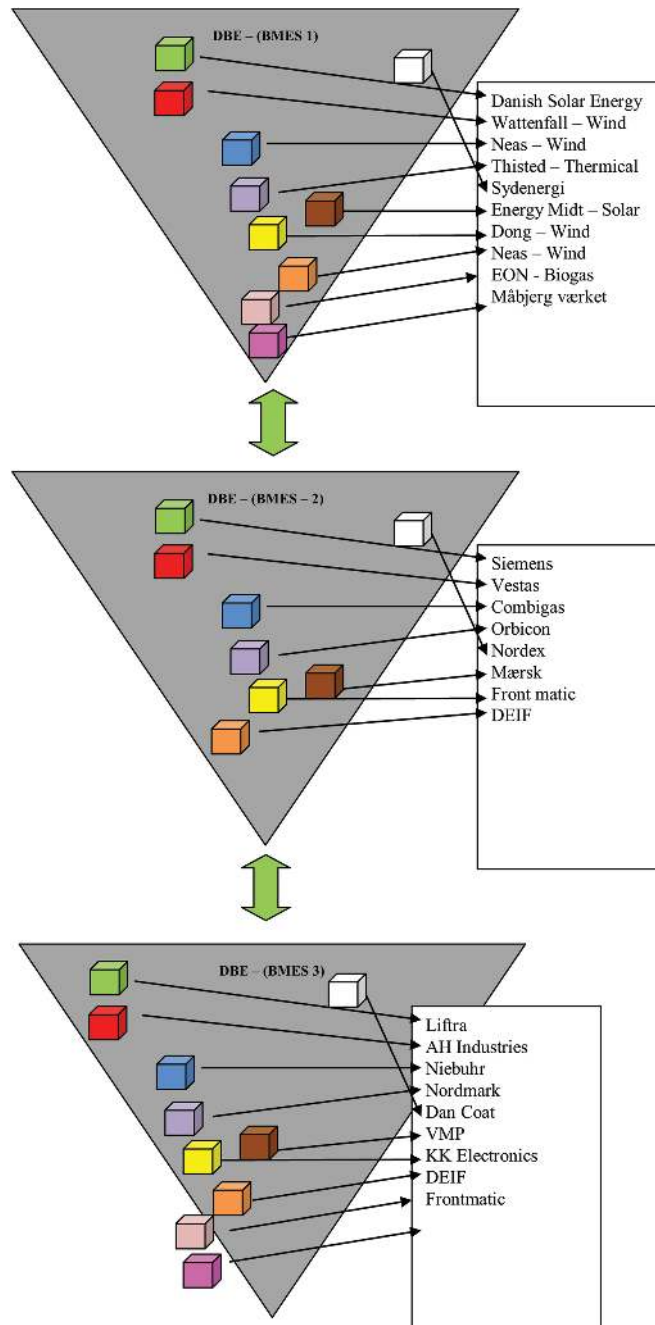


Figure 16 Vertical BMES in Danish energy production.

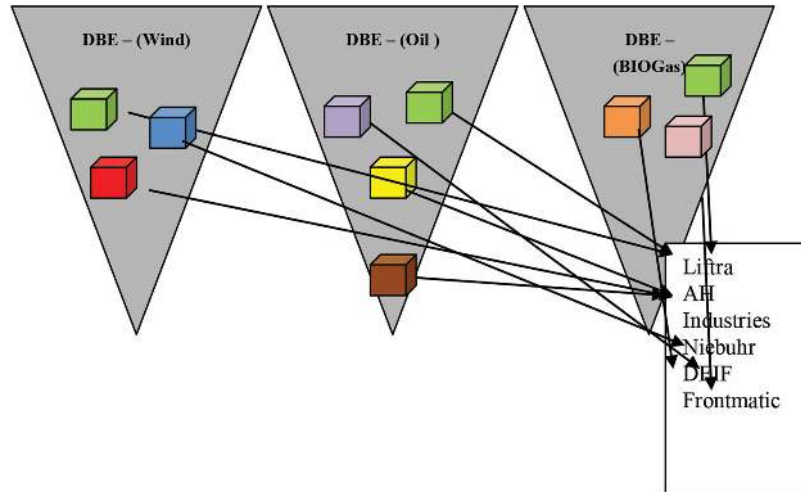


Figure 17 Horizontal BMES in Danish energy production.

MCH set up every second year a Industri Fair – a BMES – for the Wind Mill Industry and other Industries from other BMES’s. The Industry Fair called HI – Fair – functions as a BMES for 5 days. Many business with many different BM’s operates in the HI – BMES led by MCH. All BM’s present at and under the HI – BMES negotiates with MCH to be able to offer their BM’s in the BMES.

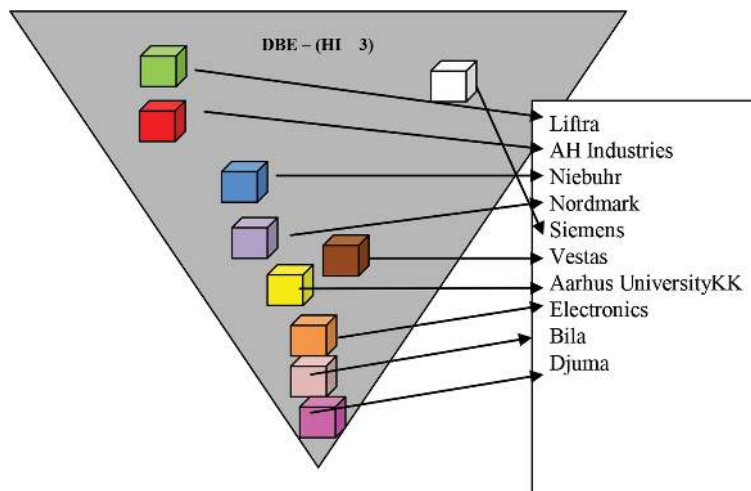


Figure 18 HI BMES set up by MCH.

Until now MCH have had very limited interest to relate to different BME but due to decline in some of MCH's BME they have decided to opening up e.g. to University BMES.

8 Discussion

Today, most academia's and practitioners consider the BM as a part of an a market, industry, sector or a cluster – measurable, objective and one of a kind. Although there are many different definitions and types of business groups most define these related to a business model level but at a business level. We have earlier propose that there is a need for a distinction between levels of business model focus, the business level and the Business model level. We propose that the BMES core level should have focus in research as “forming” an “umbrella” of “AS IS” and “TO BE” BM's represented in a specific BMES but also measured on related BMES and BMES that are not related – the BMES relation axiom. This is to prevent fuzziness and support discussion and further development of the BM theory.

Some BMES's together can form a group of BMES that is interrelated – what we call a portfolio of BMES's – e.g. renewable energy BMES, Fossil energy BMES – all focusing on energy production but measure in different viewpoint and context – either vertical or horizontally. These BMES's form a group of BMESs that have similarities due to e.g. the same customer focus, use of the same value chain, use of the same network, focus on the same mission – e.g. energy production. Often the BMES portfolio's like to be considered as interdependent like in the Green Lab case that we will comment on later in this paper. Sometimes each BMES in a portfolio compete other BMES – some time they manage to “live” in symbiosis. As earlier mentioned, some BMES's however attract users who then attract customers to other BMES's in the BMES relations portfolio.

Further, we found business be part of one (Vestas – Windmill) or even more BMES (Siemens – Windmill, Hydropower, Solarpower). BMES's are where the business BMs operate and “exchange” their value proposition. The representation of BM's in different BMES is a strategic choice of the business.

We propose that BMES business models and BMI should be viewed on different levels as shown in Table 3.

BMES can do BMES BMI at different BMES levels. The BMES vertical and horizontal level is considered as being complex but the BMES Diversification is however the most complex level of BMES BMI – and is maybe therefore often not used by BMES to secure their survival. BMES Cube can be

Table 3 Levels of business model eco systems

Levels of BMES	Characteristics of the BMES Level
BMES component	BM's Value proposition components
The Smallest part of a BMES dimension	Value attitudes, attributes of different BM's BM's Customer and User customer and User roles BM's Value chain functions Primary functions: Inbound logistics, operation, out bound logistics, Marketing and Sales, Service Support Functions: Procurement, Human Resource Management, Administration, finance infrastructure, Business Model Innovation BM's Competence Product-, Production-, and Process Technologies HR – employees/people Organizational System Culture Network Physical, digital and virtual network BM's Relations Tangible and intangible relations BM's Value formulae Profit- and other value formalae
BMES dimension	Value proposition Customer and or User Value Chain Functions [Internal] Competence Network Relations Value formulae
BMES BM's	BM of BMES both "TO BE" or "AS IS" BM Cube
BMES BMES portfolio	Group of BM's that are interrelated in the BMES
BMES Business	The core Business level of a BMES with seven dimensions
BMES Vertical	BMES's that are vertical linked together
BMES Horizontal	BMES's that are horizontal linked together
BMES Diversification	BMES's that are not linked together

useful for downloading, seeing, sensing BMES “on the way to beginoperating” (“TO BE” BMES’s) and on BMESs “already operating” (“AS IS” BMES’s). It is possible to “innovate”, “measure”, “test”, “download”, “see” and “sense” any levels of a BMES. It is possible to “see” if the BMES can operate and how and why it is functioning or not functioning. It is possible to see the BMES and its characteristics including dimensions and components at all different levels.

Summing up from the above mentioned, we propose that any BMES consists of seven dimensions – six sides and the BMES relations inside the BMES – inside the BMES that binds all the BMES BM's dimensions and components together and enables creation, capturing, delivering, receiving and consumption of values within the BMES. Business Cases

In order to approach the combination of BMES, business and BMs to define the BMES, four case studies are presented.

9 Conclusion

There are until now not an accepted language developed for BMES's nor is the term BMES generally accepted in the Business Model Literature. The paper commence the journey of building up a "language" on BMES on behalf of 4 case studies within the Danish Energy BMES,- Suppliers to Danish Energy production BMES, The Danish Renewable Energy BMES HI Fair BMES. The research show that the old thinking of industry, sector and cluster systems defined these days are very much challenged because it gives the business and even the industry a kind of false security related to what is really the market, industry, sector or cluster. Especially when competitors or other business and BMES begin to define the BMES different – context based – then "conservative" thinking businesses, industries, clusters are challenges. Challenges because they lack strategies and competitive tools as many of these have formulated their strategy on behalf of market, industry, sector and cluster thinking – some would say old school strategic thinking.

Opposite to market, industry, sector and cluster definition we propose a different terminology – the Business Model Ecosystem (BMES) defined as related to a context based and view point based approach – including both "AS IS" and "TO BE" business BM's. We propose that any BMES as define to 7 dimensions (value proposition, user and customers, value chain function, competence, network, relation and value formula. The BM is the focus as the smallest part of any BMES opposite to previous terms using the business as the focus. Each BM cube can later be detail any BM in to dimensions and components (Lindgren 2013).

The BMES framework and approach is build upon a comprehensive review of academic business and business model literature together with an analogy study to ecological eco systems and ecosystem frameworks together with studies of market, industry, sector and cluster terminologies.

BMES today has to change fast related to the context or risk in the future to vanish. BMES may consider to be established and look different from those we have seen of the past. A deeper understanding of BMES seen in a context approach could maybe give some answers to why some BMES are successful and others not.

The paper addresses the concern with the difference between “the core business” of the BMES – and the variety and strategy of its “AS IS BM’s” and “TO BE BM’s”. If the distance between these becomes to large this can be a reason to why the BMES fall apart or are challenge on its survival.

The paper proposes eight different levels of a BMES to consider – from the most detailed level – component to the dimension of a BM, business, BMES, BMES portfolio, and vertical and horizontal BMES level. The paper also propose a relation axiom of BMES which are shown in practice and verified on behalf of 4 case studies.

Conceptually, the BMES could be useful to BMES and Businesses both seen in a 3D and a 2D version. The paper shows how both versions can be useful on different levels.

10 Future Expected Results/Contribution

The study has enlightened a strong demand for testing the BMES concept in a larger scale and sample. The next step has been initiated as a bigger quantitative and qualitative empirical-based research to clarify more details of the BMES approach and its dimensions. The tests are intended to be a part of several larger EU and US funded research projects

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Appendix 1: List of Businesses Tested with the BMES Framework

Primary Cases in This Paper

DONG, WATENFALL, EON, SIEMENS, VESTAS, VLASTUIN, HSJD, AH INDUSTRIES, EV METALVÆRK A/S, HMN, CENSEC, DANISH WIND MILL CLUSTER, MCH, GREENLAB SKIVE.

Secondary Cases in This Paper

NewGibm case research 2006, Blue Ocean case research 2008, WIB 2012, ICI Case research 2013, NEFFICS 2013, SET cases 2014 and 2016.

Biography



P. Lindgren Ph.D., holds a full Professorship in Multi business model and Technology innovation at Aarhus University – Business development and technology innovation and has researched and worked with network based high speed innovation since 2000. He has been head of Studies for Master in Engineering – Business Development and Technology at Aarhus University from 2014–2016. He is author to several articles and books about business model innovation in networks and Emerging Business Models. He has been researcher at Politecnico di Milano in Italy (2002/03), Stanford University, USA (2010/11), University Tor Vergata, Italy and has in the time period 2007–2010 been the founder and Center Manager of International Center for Innovation www.ici.aau.dk at Aalborg University. He works today as researcher in many different multi business model and technology innovations projects and knowledge networks among others E100 – <http://www.entovation.com/kleadmap/>, Stanford University project Peace Innovation Lab <http://captology.stanford.edu/projects/peace-innovation.html>, The Nordic Women in business project – www.womeninbusiness.dk/, The Center for TeleInFrastruktur (CTIF) at Aalborg University www.ctif.aau.dk, EU FP7 project about “multi business model innovation in the clouds” – www.Neffics.eu. He is co-author to several books. He has an entrepreneurial and interdisciplinary approach to research and has initiated several Danish and International research programmes. He is founder of the MBIT lab and is cofounder of CTIF Global Capsule.

His research interests are multi business model and technology innovation in interdisciplinary networks, multi business model typologies, sensing and persuasive business models.