

# Homeostasis

## *The Forgotten Enabler of Business Models*

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**Abstract:** Business modelling methods most often model an organization's value provision to its customers followed by the activities and structure necessary to deliver this value. These activities and structure are seen as infinitely malleable; they can be specified and engineered at will. This is hardly in line with what even laymen can observe of organizations, that they are not easy to change and that their behaviour often is not directly centred on providing value to customers. We propose an alternative view in which organizations exist by maintaining stable states that correspond to their identity. We analyse how these states are maintained through homeostasis, the maintenance of ones identity. Homeostasis helps to explain both the inability of organizations to provide maximum value to their customers and their reluctance to change. From this point of view, resistance to change is not something to fight or to ignore but an essential force behind organizational behaviour that can be built upon for creating adequate strategies.

## 1 INTRODUCTION

Business modelling refers to the description of organizations for the purpose of understanding their informational needs. The premise of business modelling is that IT needs to support the organization and it is therefore crucial to fully understand it (Shishkov, 2011). Business modelling often begins by modelling the business processes of the organization and proceeds down the hierarchy to the way these processes are supported by the IT. In this view, a business model is a description, as complete as possible, of some part of the organization that needs IT support.

Business modelling also refers to the modelling of organizational strategy through initiatives such as Service Science (Spohrer and Riecken, 2006) and frameworks such as e<sup>3</sup>value (Gordijn and Akkermans, 2003) and the Business Model Ontology (Osterwalder and Pigneur, 2010). A business model in these later frameworks describes how a company provides and captures value (Osterwalder and Pigneur, 2010). In this paper, we will refer to business modelling as the description of the complete organization, including its business strategy.

The strategy formulation of business modelling seems to be the direct product of the two leading schools of strategic thinking (Design and positioning) as viewed by Mintzberg et al. (1998). Just like the methods inherited from these three schools, business modelling dissociates strategy formulation from implementation. Implementation, it seems, is straightforward. If the strategists can define winning business models, the company can surely implement them. Also, strategic business modelling considers that organizations exist by maximizing value to customers and capturing part of this value. This view glosses over the everyday observation that organizations define their own rules that they consider good enough for their customers. Maximizing value for customers is not apparent in even the most successful commercial companies.

When describing the operational part of Business modelling, the models mostly contain roles processes, business rules, IT systems etc. There is no description of the mechanisms that maintain the organization in place. Business modelling does not address questions such as how come the organization exists and what is its capacity for change. Business modelling is all about change in the way the organization does business today. If

there were no need to change, it would mean that whatever the organization is doing right now is working and therefore there is no need for a new business model. Implementing a new business model is not an easy change and in most organizations it either fails or is accompanied by years of upheaval. Or as Michael Hammer, who coined the term Business Process Reengineering (BPR) in the late 1980s, has subsequently said reengineering transformed (Hammer, 1996): “organizations to the point where they were scarcely recognizable.” or in other words “it saved companies by destroying them.”

This is because most of the times companies, just like any organization survive not through radical change but by closely controlling change.

In this paper, we take the challenge of explaining an essential ingredient of organizational survival called homeostasis. Homeostasis was developed in the field of Physiology by Walter Cannon (Weinberg and Weinberg, 1988) but has such a broad description that it readily useful for describing the way organizations survive in a changing environment. Homeostasis, at its core, is a struggle against change. It therefore provides a good basis for explaining why new business models often fail. Because it is at the core of what the organization is, taking it into consideration will create much more accurate business models.

In Section 2 we give a few examples drawn from everyday life and from published cases, such as Apple, to show the problem of strategy, organizational culture and customer value. In Section 3 we provide an overview of business modelling. In Section 4 we explain the fundamentals of maintaining identity and negative entropy. In section 5 we explain the concept of Homeostasis. In Section 6 we describe the practical aspects of thinking in terms of Homeostasis.

## 2 A FEW BUSINESS EXAMPLES

Whereas the focus of business modelling is to understand what value the business provides to its customers and how it provides it, there are many examples where this value is not readily apparent. These examples do not belong to failed companies but to all existing companies. We provide a few examples to illustrate this point.

### Apple’s Strategic Constancy

Apple is in the enviable position of having created a

host of products and services that customers find very valuable, which allows it to charge a premium price.

But, as much as competitors try to imitate Apple’s business model, they are often unable to replicate the same products and services. This, we believe, is explained by Katzenbach (2012) as Jobs ability in understanding the role of culture in sustained strategic capabilities. Jobs, Isaacson (2011) says, was interested mostly in creating “an enduring company.” It is more difficult to create an enduring company entrenched in culture than to create business models that imitate Apple’s. However, without the culture, the business models have little chance of succeeding, as can be seen in HP’s recent experience with the TouchPad.

Apple’s endurance can be seen in many aspects of its culture. For example, the three principles that to this day guide Apple’s Marketing Philosophy were written at its very beginning by Mike Markkula who was brought in by Steve Jobs (Isaacson, 2011). These three principles are (Isaacson, 2011): (a) Understanding customer needs better than other companies by establishing an intimate relationship with their feelings. (b) Focus on what is important and eliminating what is not. (c) Presenting Apple’s products professionally and creatively. Isaacson (2011) says that these principles shaped Jobs’s approach to business ever since.

After he was ousted from the company in 1985, these three principles held on for a while but slowly fizzled with Apple producing an ever-larger number of products with lower appeal to customers and less attention to their presentation and packaging.

When Jobs returned to Apple in 1997, he recreated its culture by various measures, such as (Isaacson, 2011): bringing back previous employees, creating incentives for keeping trusted employees, replacing Apple’s board, and removing all projects that he estimated as not focused.

The quality Jobs built into the iMac, MacBook, iPod, iPhone and iPad is in a direct line with the quality he built into the original Macintosh. Like the original Macintosh, all these products are physical sealed so that only Apple can open them. In most of these products, customers cannot even replace the batteries. Replacing batteries in Notebooks, MP3 players and smartphones is a standard and highly valuable feature, as batteries tend to fail with time. An iPhone with a dead battery can only be returned to the Apple for replacement, at a much higher cost and delay than it would be for replacing a battery in a Nokia smartphone. An evaluation of customers’ desires, will most probably list the simple and low

cost change of battery as a very valuable feature. However, this is purposefully missing from Apple's products.

Steve Jobs maintained a remarkable constancy in the kind of products he envisioned. According to Isaacson (2011) as way back as the early Macintosh days he wanted to design more curvy, colourful and friendly looking computers. Although the first Macintosh was a good start, the really curvaceous and colourful computers appeared with the iMac some 15 years later. Whereas during his absence Apple designed more and more common looking computers, when Jobs took over in 1997 he re-established the design philosophy he began in the 1970s.

As strange as it may sound today, Jobs was reluctant to allow third party developers to create apps for the iPhone for fear of compromising its security and integrity (Isaacson, 2001). Only when he found a way to bring together both aspects of opening the iPhone to external developers while maintaining strict control over what they provided, did Jobs accept to change his opinion. The result was the famous Apple Store, which today provides great value to customers as well as to Apple and to developers.

### **A Motorcycle Manufacturer**

In (Hopwood, 2002) Hopwood describes a project in a motorcycle manufacturer in the 1930s where engineering produced a magnificent motorcycle, far superior to competition but management was unwilling to invest in the new tooling that was required to produce it. The changes made to produce the motorcycle with the old tooling made it too heavy and inferior to competitors. Why would management act in such a way? Is it simply insensitivity or is it that there's something else to say about resistance to change?

### **Maintaining a Revenue Stream**

A recent article in the New York Times (Chozick, 2012) describes attempts by General Motors to maintain its appeal for youngsters. Apparently, present day youngsters are less interested in owning a car than previous generations. GM is trying to compensate for this lack of interest by hiring MTV. A dramatic cultural change is needed for GM to be able to carry out the changes that MTV deems necessary. GM does not seem to be primarily concerned by the value it provides to these new

customers but by insuring its own revenue stream in the medium to long-term future.

Prices of periodical subscription by individuals and libraries have increased even though printing cost has largely disappeared. Where is the value for the customer? At the same time, "new" schemes such as borrowing ebooks are appearing even though the borrowing of books was invented because books were a scarce resource whereas ebooks can be reproduced ad-infinitum. Again, the value for the customer is unclear.

### **On-line Retailers**

Many companies' websites terms of use, e.g. Apple's iTunes, explicitly state that they make no promise that their website contents will be error-free, that they will offer continuous service and the like. Apple even goes as far as saying that the sole remedy available to dissatisfied customers is to stop using their website.

On-Line retailers have strict policies applied to customers who want to return products. These rules vary with the location of the company. In Switzerland, for example, the rules are often much more strict than in the United States. These policies embody legal and cultural aspects of the company and of the country and region concerned. Return Merchandise Authorizations (RMA) are sometime imposed by retailers. International sales are frequently subject to stricter rules and exclusions than domestic sales. The value for the customer is not apparent in these policies.

Even Amazon.com that prides itself on its superior customer service cannot avoid having some rules concerning the return policies governing items purchased by customers. These rules exclude the returns of some items and defines what can be returned and in what state. Returns are accepted within 30 days, for example, but why 30 days? Why not 90 or 10? Why is there a limit at all? The return policy also excludes returns for items bought through the CDNOW Preferred Buyer's Club. Why are these items excluded? Also music items must be unopened for the return to be accepted whereas books do not. Why is this?

### **A Healthcare Insurance**

All Swiss residents are obliged by law to have health insurance, which they pay for themselves. Health insurance premiums for a family of four (2 adults and two children under 18 years old) is about 1000 Swiss Francs for a standard plan with the lowest co-

payment. The premiums have increased regularly every year for the last 10 to 15 years. Switching from one insurer to another is possible once a year. Many Swiss residents try to switch to the insurer that offers the lowest cost each year. In 2010 one of the smaller insurers was at the top of the list of the least expensive insurers. This insurer also had a very good reputation for quality. The result was a massive flow of new customers to this insurer. About 18 months later many new customers received a surprising and important premium hike, some of more than 60%, making this insurer the most expensive. Thus, this insurer went from the least expensive to the most expensive. This new pricing scheme will probably result in a massive drain of customers to other insurers. This price increase makes no sense if the goal of the insurer, as enterprise modelling methods consider, is to attract more customers.

### 3 AN OVERVIEW OF BUSINESS MODELING

Business modelling, enterprise modelling, enterprise architecture and enterprise engineering are used somewhat interchangeably to mean models of how an organization functions. Business modelling has emerged from the Information Technology (IT) practice as a way for IT people to understand the business's information needs. One of the early IT frameworks that integrate some aspects of business is what came to be called the Enterprise Architecture Framework, the Information Systems Architecture Framework, or more commonly the Zachman Framework (Zachman, 1987). Zachman's framework is made of a matrix in which the rows represent entities and the columns represent questions about these entities (e.g., what, how, when, why, where). The two topmost rows of Zachman's matrix represent the entities that are important to the business, the actions (processes) that are important, and the business locations.

Sowa and Zachman define a business model as (1992): the "design of the business" that shows "the business entities and processes and how they interact." From the architecture perspective inherent in this framework, a business model is seen as (Sowa and Zachman 1992): "the architect's drawings that depict the final building from the perspective of the owner, who will have to live with it in the daily routines of business."

The Reference Model of Open Distributed Processing is an ISO/IEC standard for describing

organizations, their informational needs and their IT support (ISO/IEC, 1995-98). It consists of five viewpoints on the business: Enterprise, information, computational, engineering and technology (Kilov, 1999). The enterprise viewpoint captures the purpose, scope and policies of the organization (Kilov, 1999).

ArchiMate is a more recent enterprise architecture method, which models business processes and their support by IT. ArchiMate defines business systems as dynamic systems. A dynamic system is described by active structure concepts (also called agents), passive structure concepts (also called patients) and behavioural concepts (Lankhorst et al., 2009). ArchiMate is made of three layers called Business, Application and Technology (Lankhorst et al., 2009). The business layer describes business actors and roles performing business processes that deliver products and services to external customers. The application layer describes the support provided by software applications to the business layer. The technology level describes the infrastructure necessary to run the software applications (Lankhorst et al., 2009).

The Design & Engineering Methodology for Organizations (DEMO) is a methodology for literally engineer organizations (Dietz, 2006). Organizations are said to be "designed and engineered artifacts" much like cars and IT systems but with the exception that their "active elements are human beings in their role of social individual or subject." (Dietz, 2006). In DEMO the essence of the enterprise are transactions consisting of production acts and coordination acts between the subjects. With production acts the subjects create the "goods or services delivered too the environment." With coordination acts the subjects "subjects enter into and comply with commitments toward each other regarding performance of P-acts Examples of C- acts are "request," "promise," and "decline."" (Dietz, 2006).

The examples above are all methods that attempt to model the organization with multiple viewpoints and multiple levels, i.e. from business to IT. Other business modelling methods address only the strategic definition level. e<sup>3</sup>value focuses on the exchange of value objects between economic actors (Gordijn and Akkermans, 2003). The organization is viewed only as a black box. e<sup>3</sup>value has been linked with i\*, a leading Goal Oriented Requirements Engineering method (Gordijn and Yu, 2006). Value and goal models are used to show the value activities that contribute to the enterprise goals (Gordijn and Yu, 2006).

The Business Model Ontology, BMO, (Osterwalder and Pigneur, 2010) provides multiple ways of defining business models. Osterwalder and Pigneur define the concept of business model as (Osterwalder and Pigneur, 2010): “the rationale of how an organization creates, delivers and captures value.” BMO proposes a canvas containing 9 elements: Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships and Cost Structure (Osterwalder and Pigneur, 2010). Osterwalder and Pigneur (2010) describe a number of business model patterns and show how they can be described in the canvas. BMO focuses on the strategy formulation level and doesn't have an architecture component. The execution of the business model stops at the definition of the key resources and partnerships. More recently, work is underway (Fritscher 2011) to couple BMO and ArchiMate in order to provide a more complete business layer for ArchiMate and to more finely define the execution of BMO business models.

Most business modelling frameworks assume that the organization's main purpose is to provide value to the customer. Hammer, for example (Hammer, 1996), asks the question “what is a company? What is it for?” The answer according to Hammer is that (Hammer, 1996): “a company exists to create customer value. Everything a company does must be directed to this end.” Hammer defines a customer in quite unorthodox terms. Moving beyond the notion of (Hammer, 1996) “someone who buys what the company sells.” He defines a customer as (Hammer, 1996): “people whose behavior the company wishes to influence by providing them with value.” Hammer considers as customers a much larger set than is traditionally the case. He gives the following list as customers of a pharmaceutical company (Hammer, 1996):

- A. “The patient
- B. The physician
- C. The pharmacist
- D. The wholesaler
- E. The Food and Drug Administration
- F. The Insurance company”

Notice that some of these customers, most notably, the physician, pharmacist and wholesaler would often be seen as suppliers rather than customers, whereas the Food and Drug Administration would be seen as a regulator today. Hammer's point is that their behaviour needs to be influenced by the company so that they are all willing to do their part in the sale of the medicine sold by the company. But the value expected by

each of these customers is not the homogenous. The pharmacist expects a different value than the patient and the insurance company. The Food and Drug Administration is there to impose rules that constrain the sale of the medicine.

For Hammer (Hammer, 1996): “All of a company's activities and energies must be focused on and directed to the customer, who is, after all, the source of the company's revenue.” Hammer (1996) explains why he puts customers as the sole and only reason for existence of a company by arguing that (a) shareholders also provide funds to the company but employees of a company cannot be motivated by the argument that they need to create more shareholder value. (b) In a global economy, customers have the upper hand over suppliers.

As we have seen in the various examples from the business modelling literature, value creation for customers is seen as the single most important reason for a company's existence. The resources, activities, and structure of the company are subservient to this all-encompassing goal.

With respect to the business examples we gave in the previous section, we can formulate a few critiques of this view.

If customers have the upper hand then why is it that the supplier defines the sales conditions and not the customer? Can an iPhone customer define the iTunes store conditions, or Google's privacy rules? Inspecting sales conditions and contracts of all kinds, shown in the previous section, we see that they protect the supplier more than they protect the customer. We are forced to conclude that companies cannot really maximize the value proposed to any individual customer, as proposed in business modelling.

In business modelling, it is assumed that the structure of the organization is defined once the value proposition has been defined. In other words, structure follows strategy. But structure, as Mintzberg et al. put it (1998): “follows strategy like the left foot follows the right” meaning that it is structure that enables strategy and strategy that changes the structure. Hence, without a firm structure of some kind, no strategy is possible. But where does structure come from and how is it maintained?

As we have seen, business modelling methods mostly use abstractions such as roles, agents, actors, processes, transactions, commitments, services and value. These abstractions have been carefully devised to be free of any real human element, which rarely or ever appear in these models. However, ultimately it is people and organizational

departments that must execute the business models and it is then that problems arise because they were abstracted since the beginning.

#### 4 MAINTAINING IDENTITY

Remember that Steve Jobs wanted to create an enduring company, but what did he mean by the term enduring? What is an enduring company? Let's take a few examples? Compaq existed for some 20 years, since 1982 until its acquisition by HP in 2002. During that time it could have been said to be an enduring company, since nothing ultimately lasts forever. But what made Compaq enduring and what ended this endurance? We have shown elsewhere that for an organization to exist, it needs to maintain a number of norms (states that remain stable or constant) for a set of observers (Regev and Wegmann, 2004, Regev and Wegmann, 2005, Regev et al., 2009, Regev et al., 2011, Regev and Wegmann, 2011). Based on this model, Compaq existed because it maintained a number of norms that customers, shareholders, suppliers, employees, competitors and others could see as identifying the organization called Compaq. When Compaq was acquired by HP most of its constituent elements, e.g. people, buildings, machines and even website, continued to exist but were not organized in a coherent whole that observers could identify and call Compaq. Instead, most of them were absorbed in a new structure called HP with different relationships giving them a different meaning for observers.

Drawing an analogy with biological phenomena, we can say that a company that is being acquired by another is quite similar to a mouse being eaten by a cat. The mouse maintains somewhat independent existence and as observers, we can identify it as a mouse. If it is caught and eaten by a cat, none of its constituent elements have disappeared, but the relations that they had, which made a whole that we could identify as a mouse, have been altered so that we cannot see the mouse anymore.

Whether it is a company or a mouse, from this general systems point of view, the process is the same. An organized entity that can be identified as a whole, having some integrity, is swallowed by another and cannot be identified as this whole anymore.

The concept of an open system explains the threats and opportunities posed by the environment to the organization (Regev and Wegmann, 2004, Regev and Wegmann, 2005, Regev et al., 2009, Regev et al., 2011, Regev and Wegmann, 2011). An

open system draws energy from its environment in order to decrease its entropy. Negative entropy (Negentropy) is a measure of order. In a world governed by the second law of thermodynamics, any closed system will move toward positive entropy, i.e. disorder. To maintain order an open system draws energy from its environment. In terms of our discussion above, this means that organizations exchange goods, services, ideas and money with their environment in order to maintain their internal relationships in specific states so that their stakeholders identify them (Regev and Wegmann, 2004, Regev and Wegmann, 2005, Regev et al., 2009, Regev et al., 2011, Regev and Wegmann, 2011). Organizations, therefore, must establish relationships with other organizations (Regev and Wegmann, 2004, Regev and Wegmann, 2005, Regev et al., 2009, Regev et al., 2011, Regev and Wegmann, 2011). These relationships, as we have seen are necessary but also potentially harmful (Regev et al., 2005). Compaq, for example, had to have relationships with its competitors, which opened the door for its acquisition by HP.

To endure, therefore, the organization as much as the animal, must protect itself from threats to its organized whole. Not all of these threats come in the form of a cat or a buyout. The organization must protect itself from many threats, most of which may look benign (consider Amazon's threat to Barnes and Noble or Borders in 1995).

In the next section we explain Cannon's heuristic device, Homeostasis, which explains how this protection is done.

#### 5 HOMEOSTASIS

Homeostasis is a term coined by Walter Cannon, a physiologist, to describe the way a human body and other organized entities maintain constancy in a changing world (Regev et al., 2005, Regev and Wegmann, 2005, Weinberg and Weinberg, 1988). Homeostasis literally means (Weinberg and Weinberg, 1988): "remaining the same."

Weinberg and Weinberg (1988) describe Homeostasis as a heuristic device to think about how states remain constant (i.e. how norms are maintained). They provide the following quote from Cannon (Weinberg and Weinberg, 1988):

Proposition I In an open system, such as our bodies represent, compounded of unstable material and subjected continually to disturbing conditions, constancy is in itself evidence that

agencies are acting or ready to act, to maintain this constancy [...]

Proposition II If a state remains steady it does so because any tendency towards change is automatically met by increased effectiveness of the factor or factors which resist the change. [...]

Proposition III The regulating system which determines a homeostatic state may comprise a number of cooperating factors brought into action at the same time or successively. [...]

Proposition IV When a factor is known which can shift a homeostatic state in one direction it is reasonable to look for automatic control of that factor, or for a factor or factors having an opposing effect. [...]

Note that Cannon speaks in very general terms, he takes the example of a body but what he says can be applied to any enduring organization. Hence, Weinberg and Weinberg (1988) note that homeostasis is a very general and useful heuristic device.

Weinberg and Weinberg (1988), give colourful names to Cannon's proposition, arguing that they are so important that they merit memorable names. They identify 5 principles in Cannon's four propositions. The fourth proposition giving two distinct principles. They thus call them pervasiveness, perversity, plait, pilot and polarity principles.

The Pervasiveness principle is a general statement that draws our attention to the fact that in a changing environment, behind every constant state there are mechanisms that act against change. It refers to the ubiquity and never ending nature of regulatory mechanisms. It reminds us that we need to investigate how each entity we observe is maintained constant.

The perversity principle tells us to look for activities that maintain this constancy (Weinberg and Weinberg, 1988). Not only should we look for activities, but we should also expect increased effectiveness of these activities when they oppose change.

The plait principle tells us to look for multiple mechanisms and not stop when we found only one (Weinberg and Weinberg, 1988). A homeostatic system brings together multiple mechanisms, each having a specific state to maintain constant.

The pilot principle makes us look for an automatic control of each mechanism (Weinberg and Weinberg, 1988). This automatic control explains, in part, why we often do not see homeostatic mechanisms. When some state is controlled

automatically, by definition, no conscious control is needed. Hence, most homeostatic mechanisms are applied without us even being aware of them. They have been internalized and made tacit (Vickers, 1987). Often, it is only when they fail that we become conscious of them, as shown in (Winograd and Flores, 1986).

The polarity principle makes us look for mechanisms that have opposite effects from one another (Weinberg and Weinberg, 1988). These are mechanisms that counter the counter of change. These opposing mechanisms can be quite confusing. They act against each other in ways that often seem to us to be at odds or to be inconsistent. Their overall effect, however, is to ensure that the state controlled by the homeostatic system does not stray outside the tolerance level, or as Weinberg and Weinberg (1988) call them, the "critical limits."

A homeostatic system does not distinguish right from wrong. It only maintains some state constant. It doesn't care whether maintaining this constancy is good or bad. This is as true for a human body as it is for an organization. Weinberg and Weinberg describe this property of homeostatic systems as (1988): "The same mechanisms that prevent us from being poisoned also prevent us from being medicated." The "right" strategy that may be able to save a company can be effectively diffused by homeostasis. When conditions change and the homeostatic system doesn't, its reaction to change may not be effective. Hence, it is up to an observer to determine whether a given constancy is good or bad, not for the homeostatic system itself.

What we often call learning, is a way to change this constant state (Regev and Wegmann 2005). This means that the homeostatic system needs to create new mechanisms for maintaining this state constant.

The perversity and polarity principles create inconsistency that is often judged by observers to be a bad situation to be corrected but is merely what it takes to maintain constancy.

Despite the complexity of a homeostatic system, it may not always be successful. If all homeostatic systems were always successful, nothing would ever change and everything would last forever. Thus, when some changes occur, the homeostatic system will adapt to them and different mechanisms will be produced to enforce a new constancy. This may result in a new identity for one or more observers.

Because homeostasis is such a ubiquitous phenomenon in enduring organizations and because business modelling is ultimately concerned with creating enduring organizations, homeostasis has a very large applicability to business modelling. In the

next section we outline some aspects that can be used in future business modelling methods.

## 6 HOMEOSTASIS FOR BUSINESS MODELING

We begin by asking the basic question of what does it mean to be part of an organization, or to be inside an organization. What we put inside the box of an organizational model, such as the one in Figure 1, is not necessarily what is physically contained in it but what is subject to the protection of its homeostatic system (Weinberg and Weinberg, 1988). A company is not necessarily physically contained in one area or building and even if it is its people come and go from the given building. What does it mean then to be a member of a company? As Weinberg and Weinberg (1988) explain, it means being under some protection from some threats. This protection is not absolute. It simply makes it less easy for the inside of the organization (Weinberg and Weinberg, 1988) “to come into equilibrium with the exterior.” This in turn means that signals or stimuli from the environment will not be easily transmitted to within the organization. Physical containment is also offers a homeostatic protection.

The business rules, terms of use, conditions of sale, contracts etc. that organizations impose on their suppliers, members and customers are the visible part of homeostasis. They are designed to protect the inside of the organization from what it considers to be unstable relationships inside and outside the organization. Remember that Cannon refers to “unstable material and subjected continually to disturbing conditions.” Enduring organizations have multiple mechanisms in place in to enforce these rules, as specified by Cannon’s propositions.

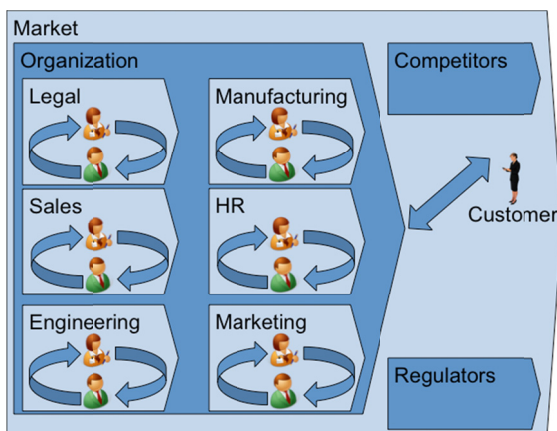


Figure 1: What makes these relationships durable?

These mechanisms will be upheld by different entities within the organization, each having its own homeostatic system. Referring to Figure 1, we can ask what makes each of the entities within the organization lead a somewhat independent existence, what makes it durable. As homeostasis is a heuristic device for understanding continuing existence, we can presume that each entity in a business model has some sort of homeostatic system that keeps it alive. This, in turn, means that some of its activities will not be aligned with the overall organization’s needs. Total alignment inside or outside the organization, as sought by Enterprise Architecture methods is not even an idealized situation but a non-desired situation. Because we want our models to be as accurate as possible, it is useful to model these homeostatic mechanisms.

Business modelling is often done with some change in mind. We make a model of the organization as it is today (the as-is model) and the way we want it to be in the future (the to-be model). Modelling the homeostatic mechanisms can be useful in both cases. For the as-is model this would explain what makes the organization or some part of it durable. For the to-be model it would explain how to make it durable.

When creating strategic business models for a company. We need to pay attention to the structure of the company and the way it is maintained through homeostasis. The structure, maintained by homeostasis can either enable the envisioned strategy or defeat it, depending on whether the strategy fits the structure. In Apple’s case, Jobs was fortunate that some of the culture (read structure) of Apple pre 1985 still existed. He reinforced it by removing projects and people who did not fit it (a homeostatic mechanism) and proceeded to a strategy reminiscent of 1985. This in itself is a homeostatic reaction because Jobs countered the change that Apple was subjected to from 1985 to 1997 and imposed the same vision and strategy that was there before, albeit with some minor changes. Remember that the new Apple products (e.g. iPhone, iPod, iPad) share some of the basic characteristics of the original 1984 Macintosh, for example, sealed cases, integrated hardware and software, very close attention to design and packaging. This has not happened by chance, but is due to Jobs’s constancy being imposed on Apple. Prior to Jobs’s return to Apple, Apple was producing computers that accepted expansion cards, which increasingly resembled IBM PCs. This strategy was brought to halt when Jobs’s constancy took over.

The homeostatic system’s ability to maintain



constancy in the presence of change sometimes has negative implications (from the point of view of some observer). Hence, Jobs unwillingness to allow third party developers to offer applications on the iPhone in order to maintain its integrity and despite extensive lobbying from colleagues could have resulted in serious loss of business opportunities. Again, Jobs agreed to open the platform only when he was convinced that he could control the applications, in itself a research for homeostasis.

We should not forget the polarity principle of homeostasis where homeostatic mechanisms have opposing effects. In Apple's example, Jobs slashed the majority of Apple's products and laid off thousands of people (Isaacson, 2011) in what can be seen as an attempt to defeat Apple's homeostatic system created while he was away.

The perversity principle can explain another action that saved Apple. Jobs convinced Bill Gates, Apple's main competitor, to invest \$150M in Apple. Saving a competitor is a way for the homeostatic system to not damage itself by being too successful in moving a state in a given direction. If Microsoft would have been too successful in driving off competitors and Apple would have gone bankrupt, Microsoft would have been more vulnerable to the anti-trust litigation that was already beginning.

In the case of the Swiss healthcare insurer, the reversal in strategy can be explained by the homeostatic system prevailing on the change that is considered unacceptable. The insurer was overwhelmed with the new influx of customers from regions in which it was not traditionally present. It risked lowering its quality standards. By law, it has to have a certain reserve of money for each person insured and it was difficult to have this reserve with a massive influx of customers. All in all, the insurer preferred to get rid of many customers in order to maintain its quality standards and its compliance. This is a typical homeostatic reaction. Thus, the organization separates between customers that it wants to keep and those that it does not, thereby maintaining the states that it deems important (level of quality, reserves) unchanged. The value to these customers may be described as negative. We see that the homeostatic system does not necessarily maximize value for a given customer.

Likewise, insuring a revenue stream drives companies such as banks and mobile phone operators, to provide better service to customers who bring large revenues (premium customers). Just providing value to customers is not the main point. It is rather insuring a steady or steadily increasing revenue stream. Maintaining a steady revenue

stream also explains why it is the supplier that usually fixes the price of a good or service. It is rarely the customer who fixes the price. If companies were truly interested in providing value to customers, they would give their products or goods for free or would allow customers to negotiate the price. Similarly, employees do not fix their own salaries so as to maintain the profit of the company. When the revenue or profit do decline below expectations (below what the homeostatic system defines as acceptable) many actions will be taken at the same time or successively, as described by the plait principle, in order to reduce cost, increase sales, increase research and development, warn shareholders to lower their expectations, freeze hiring, renegotiate credit, layoffs etc. Some of these actions may ignite other actions from other homeostatic systems, such as strikes and demonstrations by employees, intervention by political authorities, and the like.

The obliviousness of homeostatic systems for the goodness or badness of the constancy they maintain often results in frustration by change agents. For a homeostatic system, every change is a threat, not an opportunity. An opportunity is necessarily a change to a state kept constant by the homeostatic system and is therefore an unwelcome occurrence.

Finally, taking homeostasis seriously is to accept inconsistencies rather than seeking alignment. From a homeostasis perspective inconsistency can be seen from the polarity and perversity principle perspective as a necessary mechanism to insure survival.

## 7 CONCLUSIONS

Business modelling methods take the underlying organization that is supposed to carry out the strategy defined in the business model for granted. They assume that the organization will either follow the defined strategy or that it can be engineered to fit the strategy. In essence they consider that the organization has an infinite capacity to change. This is overlooking the everyday observation that any organization that has been in existence for even a few years has built some very strong mechanisms that resist change.

Any surviving organization has adapted to a specific environment. It has built a fit (or congruence) between its environment (customers, regulators, investors, competitors) and its internal structure. Changing this internal structure to fit a different environment is quite difficult. Without

taking this aspect into consideration, the probability of successfully implementing a new business model is very low. Business modelling must take this into account. Homeostasis is a heuristic device that provides a plausible explanation to the way organizations resist change in order to maintain their identity and therefore survive in a changing environment. We have shown that homeostasis can explain both formulation of Business Models (how to deliver and capture value) and the operational part (how the strategy is carried out).

Modelling homeostasis does not mean that we consider that change is impossible, only that change is very hard to create and maintain. To institute change, the homeostatic system first must be neutralized. This is very hard to do because of Cannon's four propositions. However hard it is, resistance to change can have very good reasons that need to be investigated.

Weinberg and Weinberg (1988) point out that Cannon doesn't speak of goals and targets but rather about constancy. A homeostatic system, therefore, has no specific goal or target. It simply maintains some constancy with whatever number of mechanisms it can bring to bear. If we want to take homeostasis seriously, being that it provides such a good explanation of organizational life (and even life in general), we need to overcome our own homeostatic system and remove the terms goals, targets, purpose, ends etc. Rather we need to search for constancy and how it is maintained. This can be a radical change in business modelling, a change that its own homeostasis may be unwilling to allow.

This work should be followed by a more humanistic view in business modelling, modelling people and their attitude toward change rather than the traditional role, business rule, business process paradigm.

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