

# PROVIDING A FRAME OF REFERENCE FOR EMPOWERING ORGANIZATIONS' MANAGEMENT AND CONTROL

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## Abstract

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The tools for the definition, implementation and tracking of organizational measures, such as strategy, have become much more advanced in recent years and today's information technologies, especially WEB2.0 technologies and their ability to integrating with conventional ERP systems, make the vision of the "integrated organization", at least from an IT perspective, feasible. Management science and practice, after attaining a sound basis for integral organizational design, control and development in the 1970s through the thought leaders of cybernetics and constructivism, has taken a step back. This has led to a massive misuse of IT and to a resource obliteration that sustainably inhibits organizations from reaching market potentials and customer demands. This text provides scholars and managers with an introduction to a framework that allows them to answer the organization's issue of "what do we do?" from an integrated business perspective and thereby enables them to realize their full potential of "how do we do it?". Being able to derive this, managers can actually incorporate IT to support the organization's progress rather than the other way around.

**Keywords:** Organization, Structure, Strategy, Control, Culture, Viability, Recursivity, Frame of Reference, Management, Purpose, Alignment

## 1. INTRODUCTION<sup>14</sup>

In modern corporations, hierarchical levels, especially management levels, are constantly being expanded. In the meantime, ways to use synergies and to improve interdepartmental cooperation are continually being discussed. As a result, a culture of the meeting is established and topics which should simply be addressed in work process descriptions and organizational structure are delegated to task forces which again have too many members. Results are frequently poor and usually, discussions are just being adjourned. Everyone is somehow involved everywhere. Thus, authority and responsibility are unclear and organizations keep reorganizing themselves repeatedly, with no "room" for developing in a purposeful manner.

At the same time, the mapping of organizational processes has become and continues to be ever more

refined in its description of operational details. To make a metaphor, one can say that the means with which maps of organizations and their surroundings are produced has reached a level of detail that is comparable to a physician drawing a map of a person on which one can see every single cell and their respective surroundings. In accordance to this, we have grown the belief that by knowing these details we can more easily assess the system's behaviour and manage it by altering the single cells in their constitution. Managers, therefore, strive for ever more detailed knowledge about the internal affairs of the system and, in doing that, they demonstrate that they care much more about the on-goings of every operational detail than what they are supposed to be responsible for: *the organization as a whole*. They treat the organization like a so-called "trivial machine", which objectively exists and of which the internal transformation functions are known. Heinz von Foerster (2003) points out that a trivial machine has low complexity and can successfully be altered in its details in order to alter its constitution or behaviour. To pick up the metaphor of the physician

<sup>14</sup> Although this paper represents the result of a common effort from the Authors, paragraphs 1 and 2 have been mainly developed by Renato Giovannini, paragraphs 3 and 4 have been mainly developed by Bruno Marsigalia, paragraphs 5 and 6 have been mainly developed by Piero Lolli.

and his patient, this would imply that all the physician has to do in order to establish and maintain the patient's overall health, is to ensure the well-being of every single cell on its own. This is what the first-order cybernetics is about: *observed systems*.

On the other hand, as Stafford Beer (1994) – the founding father of Management Cybernetics – and von Foerster (2003) show, complex social systems, like organizations, are by definition non-trivial, which means that the internal function that determines the behaviour of the system cannot be known; the system is a “black-box” and displays emergent characteristics that are more than the behaviour of the sum of its parts. It all relies on the well-established belief that frames of reference depend on the observer and not on the object under observation; that the object as such does not exist and, surely, not in a way that lets us measure its properties and that *therefore the management of complex systems can only be concerned with the setting of subjective boundary criteria for the system and its behaviours and with the acceptance of the responsibility for these subjective choices*. From constructivism to model-dependent realism, it is agreed that agreement is needed to agree what we want to agree about (Hawking, 2010; Einstein, 2006). As stated by Allen and Varga (2006), the problem of deciding on conditions, boundaries, management methods and so forth, needs to be addressed much earlier on, in the epistemology of the person(s), or observer(s) who is in charge of the management of the organization and who decides which mappings and procedures are essential for the respective organization he is responsible for. If this is not taken into proper consideration and the focus is put on improving the procedures or means with which a task is carried out, modelled, or depicted, the power of the means used is lost. It does not matter how close to “perfection” these means become, as long as it is the wrong task that is carried out. To pick up our previous metaphor, *we have to agree what it is that we map, before we perfect the means of how we map*. Surely, as Beer points out on numerous occasions, the developments in our economic, political and social environment can only be interpreted in a way that suggests that Einstein was very right when he said that “a perfection of means and confusion of aims, seems to be our main problem”. Classical organizational approaches as brought about by business schools, do not provide managers with a language that allows them to create a consistent and integrated theory of their respective organization. Such a consistent theory would enable them to *share an understanding* of the organization as a whole, from strategy to operations and from cultural aspects to IT landscapes, with superiors, peers and inferiors, in order to ensure agreement of the “what do we do?” and thereby realize the full potential of expertise of the “how do we do it?” (Beer, 1994). This is the realm of second-order cybernetics: *observing systems* (von Foerster, 2003).

After portraying the theoretical framework and main literature underlying the subject of the research (paragraphs 1, 2 and 3), the paper outlines the operational functioning of the method (paragraph 4), to finish with considerations on the potential practical application of the same to modern organizations' management and control (paragraph 5 and 6).

## 2. FINDING A FRAME OF REFERENCE

A definition of Management by Hans Ulrich, the founder of the St. Gallen Management Model and as quoted by Schwaninger (2009): “Management is the design, control, and development of complex systems”. In order to cope with highly complex systems, a manager needs to be able to embrace the above mentioned scientific findings and be familiar with the second-order cybernetics to have a sound basis for his theory of the organization.

*A system is a whole that is more than the sum of its parts*. It has emergent properties which originate and are exclusive to the interaction of these parts. Without their interaction, the parts are just the parts. It is the way in which the parts are put together, or structured, which determines the behaviour of the system or a given state of the system, as perceived by an observer. Beer explains that *complexity* is the property of a system that allows it to take on multiple, distinguishable states. In Management Cybernetics the quantity of distinguishable states is called “*variety*”, to evoke some sort of quantifiable meaning. In this manner, the term “variety” becomes inserted in scientific management (Beer, 1994). One of the early fathers and leading thinkers in Cybernetics, Ross Ashby, formulated the so-called “Law of Requisite Variety” also known as “Ashby's Law”: “Only variety can absorb variety” (Schwaninger, 2009; Conant & Ashby, 1970). The word “absorb” may be replaced, for better understanding, with “control”. In this context, it has to be made very clear that “control” is not to be understood in terms of “to forbid or to inhibit” but in terms of “to steer”. In practice, Ashby's Law signifies that a complex system can only be controlled by a system with equal or more variety. Should the control system be of less variety than the controlled system, the control system would not be able to steer the controlled system. This fact is known as the Conant-Ashby-Theorem (A): “The variety of a control system needs to be at least as big as the variety of the system to be controlled”. In fact, the “power structure” of the whole will shift and the system with the higher variety will take control. Conant-Ashby (A) can be rephrased as follows: “whatever has higher variety will control whatever has lower variety”. *One way or another Ashby's Law is a Law of Nature and will always assert itself*. As Stafford Beer once put it: “In short, the regulator has to be capable of generating a variety equivalent to the variety that has to be regulated – or the regulator will fail. It really is no use to hope for the best. To maintain regulation – equilibrium between antithetical subsystems, or stability in the whole – there is a certain variety required in the regulator; and this cannot be less than the variety the black box of our concern itself proliferates [...]. There is nothing else that can do the job. Equivalent variety in the regulator with respect to the variety of the black or muddy box is required. It is not required by ukase, by democratic decision, by the manager, or by me: it is required by nature – in the sense that this is how things are. Hence it is appropriate to call the natural attribute of systems that guarantees their self-regulatory powers the law of requisite variety - Ashby's Law”.

The implications of the above, in combination with Beer's remark on the quantification of varieties

("there is more to quantification than numeration") are far-reaching. The results of ignoring it are disastrous. In the last years, it has become a much too common slogan to "reduce complexity", or "cut down variety". If you do that, you will inhibit control. *Now, if this introduction to management is understood the respective manager has attained first ability to establish a consistent model of the organization he needs to manage.*

Every time we talk about complex structures we must refer to models of them. A *model* is by definition a *representation of the complex system*, which reproduces the variables we, as observers of the system, find relevant. We decide which particular system we want to discuss and therefore we do so by identifying a model of that system. Keep in mind that, with regards to Einstein and Heisenberg, this is all very subjective because it all depends on the frame of reference of the subject, the observer. As Stafford Beer stated: "the big problem is: you are not determining absolute facts; you are establishing a set of conventions. So remember: a model is neither true nor false; it is more or less useful." But we have to establish a model because every decision-making unit or controlling instance must have a model of the controlled system within itself. This is not wishful thinking; it is, by way of Ashby's Law, a necessity. It follows Conant-Ashby-Theorem (B): "Each control system needs a model of what is to be controlled. That model must have sufficient variety" (Beer, 1994; Hawking & Mlodinow, 2010; Einstein, 2006; Schwaninger, 2009; Conant & Ashby, 1970).

And this is where today's management practice and theory fails badly, the indoctrinated models lack variety and most of it is lost in the definition of the proper frame of reference or, as Stafford Beer refers to it, in the nomination of the proper level of *recursion* (i.e. the implementation of a process to successive levels of system elements within a system structure and the outcomes of it are used as inputs to the following level in the system structure; not to be confused with "iteration" which occurs when processes are repeated at the same system level).

### 3. CONSISTENT MODEL

If a manager is able to identify a proper and consistent level of recursion, he has established the main cornerstone for the successful management of the overall organization and allocation of resources to the organization's benefits.

It must be emphasized that the level of recursion that a manager has to deal with, must not be imprudently tampered when considering how to manage it. As a complex system, the organization must exist on its own, in a way that allows it to change and to move within its environment independently, without alteration. There must not be any "jumping" between the levels of recursion. The lower levels of recursion, are black-boxes, complex-systems themselves who strive for their own viability and the management of the organization under observation, or "System in Focus" ("SiF") can only be concerned with setting boundary criteria for the behaviour of its constituting parts (each one of the so-called "System 1"). A *proper organizational structure* allows an organization to grow in a robust and sustainable manner and at the same time to stay flexible without altering the structure as such. It has

to allow change without alteration. The structure has to be invariant; it has to stay constant from the cradle to the grave. In such a structure the information allocates itself where it is needed, in a continuous dynamic-equilibrium of oscillation and homeostasis. To put it simpler: the information is captured by the organization, thanks to its structure, which makes it available to be captured by the right people. So, the management must not focus on finding every little detail about some happenings on levels of recursion that don't concern the organization. The management must focus first on *concerting the systemic functions* that are necessary for the viability of the organization within its frame of reference.

Stafford Beer discovered precisely that structure and elaborated on the neurological, mathematical and philosophical postulates and insights in his books "Brain of the Firm" and "Heart of Enterprise" where he laid out the groundwork for dealing with the management of highly complex systems. He called his model of that structure the *Viable System Model* ("VSM"). The VSM provides a different angle on the organization; its motto is no longer "Where & Who" but "What & How". It replaces classic functions like marketing, finance, HR, Sales, etc... with *five systemic functions*. These five functions are the sufficient and necessary conditions, in its mathematical sense, for the viability of any system. They are: 1. Operations, fulfilment of purpose through operations of the constituting units; 2. Coordination; 3. Optimization; 4. Clarification, providing purpose and strategy for the whole; 5. Normative closure, providing homeostasis between 3 and 4.

The power of the described method is enormous and can, in cooperation with today's IT, yield massive business advantages, but only if a consistent understanding of the level of recursion is achieved and resources (such as IT) are thereby aligned with the business of the organization and not the other way around. If this occurs and the level of recursion of the SiF, is identified and designed in a way that the organization has the requisite variety to deal with its internal and external environment, *its viability (as the ability of the organization to maintain an autonomous or independent existence) is ensured*. If the requisite variety is not attained the organization will cease to exist. The VSM consists of the system, plus its metasystem or management, plus its relevant environment (Beer, 1994).

This way a manager is able to gain clarity for himself as well as others about the "what do we do?". And can now focus proper attention to the "how do we do it" and thereby gain massive business advantages through the adequate use of resources.

### 4. WORKING WITH THE VIABLE SYSTEM MODEL

In today's management world, there is no binding connection between formal organizational aspects and the strategy work done for the organization. Strategies are being defined without logical deductions to and from the structure, and culture of an organization.

The VSM connects strategy, structure and culture of the respective organization in a binding-logic. It integrates the organization as a whole, from

fulfilling its purpose for the customer at an operational level to dealing with the ever-changing environment with strategies, to providing closure through normative governance. It thereby enables the manager to form the whole organization in such a way that all five of Peter Drucker's (1990) questions can be successfully dealt with. It is a model for the design and improvement of organizations of any kind, on all levels of management. It is independent of the organization's size, its development stage, its existing surface structure, and the sector in which the organization operates. It depicts the invariant control structure of a highly complex, viable system.

#### 4.1. System 1 – Operations

In the VSM, the outline of the operative units (i.e. "Operations" or "System 1" or "S1"), is done in a way that enables to, not only make the strategy conform to Peter Drucker's first question ("What business are we really in?"), but to also make the logical connection to the organization's structure and, therefore, implement the strategy accordingly. The rules of the market, mainly the customer-benefit (the customer problem invariant of its solution) (Gälweiler, 1990), overlapping with the company's own strengths, its competitive advantage, provide the criterion for the outline of the single S1s. The whole SiF exists because the S1s assign part of their autonomy to the whole system in order to benefit from being part of the whole; they must abide to the rules of the game enforced by the SiF.

A logical connection needs to be established between the customer and the company, and that can only be achieved with a logically binding connection of the company's strategy and structure based on the customer. If a strategy is based on backward oriented financial performance indicators, the strategy will not sustain. Profound knowledge of Gälweiler (1990) is prerequisite for designing a strategy process.

#### 4.2. System 2 – Coordination

The S1s control their own actions in their own environment by amplification of their own variety and/or by attenuation of their environment's variety. This way the S1 is able to maintain a separate existence by itself (to ensure its own viability).

Management dissolves the remaining variety by coordination of interactions between the S1s: making sure that synergies are used, frictions are mitigated, guidelines, policies and specifications are met and the functioning of the whole is ensured (this is the so-called "System 2" or "S2").

#### 4.3. System 3 – Optimization

System 3 ("S3") is the function which designs or programs the S2 and optimizes the cooperation between the S1s. It allocates disposable resources for the functioning of the whole with regards to the purpose of the whole. Besides the programming of S2, S3 has the option to directly intervene in the actions of the S1s. The intervention has to be done with care and must not become routine involvement in the daily business of the S1 (i.e. micromanagement); otherwise the unit is seemingly

not viable on its own merits. The S3 function is also called the management of the "inside&now", referring to the fact that it is only concerned with the governing of the actions taken by the SiF in the present. S3 is what the S1s cede parts of their autonomy to, via a resource bargain, in which the S1s obtain resources, to which they would not have access otherwise, in exchange for parts of their autonomy.

In order to obtain information which is not filtered via the resource bargain channel, which takes place between the S3 and the S1s' management, the S3 can look directly into the operations of the S1s via an auditing channel, 3\*.

#### 4.4. System 4 – Clarification

The SiF deals with an environment which is "bigger" than the combination of the environments of the S1s. System 4 ("S4") is responsible for the management of the "outside&then" of the whole organization. A properly done strategy has its "starting point" in the S4 function.

There is an on-going oscillation between internal, S3, and external, S4, factors with regards to the definition and implementation of a strategy. This must be brought into homeostasis. Otherwise, the organization remains in the "here&now", or heads into the unknown without knowledge of where it is today. In both cases, the organization will cease to exist.

#### 4.5. System 5 – Normative closure

System 5 ("S5") which is purely metasystemic provides closure to the oscillation between S3 (the "here&now") and S4 (the "outside&then"). This is what ethics, self, etc. is about, the "This is what I do".

### 5. PRACTICAL EVOLUTIONS IN ORGANIZATION STRUCTURES

The following is a summary, from the point of view of the cybernetic principles in the discussion, of the changes in the organizational design recently occurred in a firm providing engineering services.

The organization (A) has for years been managed by using a model that can best be described as a very classic "functional" organization: people performing activities of the same nature, such as purchasing, production, finance, sales, etc. are grouped together forming functions. In such a structure, the individual functions usually display a very high proficiency and efficiency in what they do and, as long as the company's environment (i.e. customers, suppliers, competitors, etc.), does not display a high rate of change and complexity, the organization can survive quite well and so was the case of our company. But as soon as the organization has to act as a whole that is more than the sum of its parts, (e.g. because the environment displays increasing variety), the high "local" proficiencies and efficiencies do inhibit overall effectiveness. *Functional models often lack the variety to actually manage an organization in its environment.*

In company (A) knowledge sharing, the use of

companywide synergies, the rate of innovation, workloads planning, in brief, every aspect impacting overall efficiency and effectiveness, suffered significantly when the market became more volatile and customer demands became more differentiated. In the last years, the company (A) has, like many companies worldwide, experienced an increase in competition, with customers needing quicker responses and more innovative solutions, which required the capability to design and to customize. In addition, the shrink in public budgets has led, in most cases, to the replacement of private negotiation with public tenders. This implied a growing pressure on prices and contractions of margins which put pressure on the cost structure of the organization.

Subsequently, the middle and upper management layers of our company (A) became ever more engaged in micromanagement, with a clear focus on further cost-cutting as the last remaining option for action. With regards to this text's topic, it needs to be emphasized that micromanagement is concerned with fixing day-to-day activities. *In the absence of a uniting, overall framework of organizational purpose and guidelines, management tries to right things by intervening in the very details of daily operational activities.* In such a setting, resources like IT are used to provide knowledge about the activities of the organization in as much detail as possible and thereby enable further manipulation of these details. IT is not used to support and drive business, but to identify saving potentials regardless of the impact on business development. The whole affair then becomes a vicious, self-enforcing circle.

The picture in Figure 1 depicts what has been described above, from a cybernetic perspective. It shows that operations do not have requisite variety and cannot properly deal with their respective market due to the constant intervention of systems 2, 3 and 3\*. Micromanagement also causes the

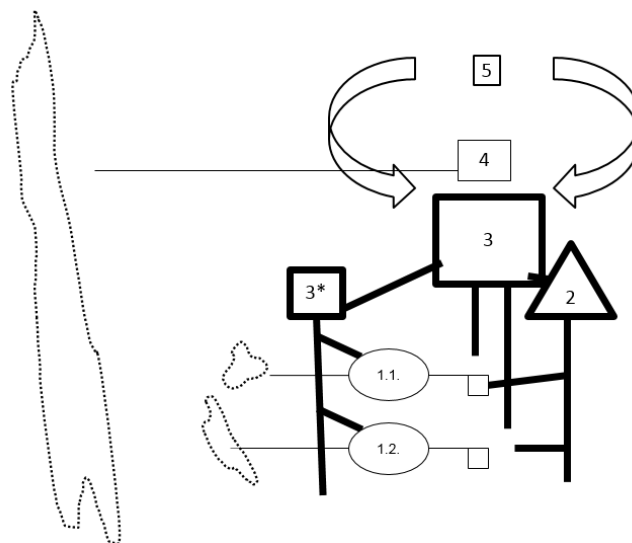
systemic function 4 to be mostly neglected and the strategy to be done *in vacuo* (the strategy process cannot "reach" the actually relevant environment of the organization). There is no interaction between system 4 and 3, thereby the SiF remains in the "here & now" because even if there are strategic plans for organizational development they cannot be implemented through the organization's present activities. Since anything is only relevant once it is reflected by actions as to be observed by an external observer, it can be stated that there is no overall strategy, there is no purpose of the whole.

The overall development of the organization, but also the day-to-day functions that are directly dependent on the strategy process, such as planning workloads and R&D, or the coordination between sales and engineering and production, etc. are greatly inhibited and respectively only take place with the goal of cost control. The missing squiggly lines between the single system 1s (compare Figure 1) display that there is little interaction and use of synergies.

Moreover, system 5 cannot provide any normative closure to something that does not constitute an integrated whole. The system is clearly in hand of the systemic function that optimizes the current operations, middle management, which is being micromanaged in all aspects and thereby robbed of the required variety that makes it able to cope with its actual surroundings. As a result of this, the coordination function, the system 2, which in today's organizations is mainly manifested in IT structures and controlling and all sorts of budgeting procedures, is overdesigned and requires ever more resources, but it never realizes its potential due to the poor overall design of the SiF.

With regards to this text's topic, this is how the IT burns through resources by trying to optimize the "how do we do it" without ever supporting the actual business of the company because of the missing understanding of the "what do we do".

Figure 1. A depiction using the VSM of company (A) before 1<sup>st</sup> intervention



Note: The management of the individual system 1 (very small box) does not exist as such and the usual command axis from 3 to the management of 1 do not exist. The operations are directly steered by intervention via 3\* (monitoring).

There are two points of leverage that can be used to empower the organization and make it manageable through both a sufficient internal variety, in order to deal with its environment and integration: the first one is the strategy process, the second one is the organization's normative governance.

The strategy process has been used to achieve an integrated understanding of the "what do we do" in the entire organization.

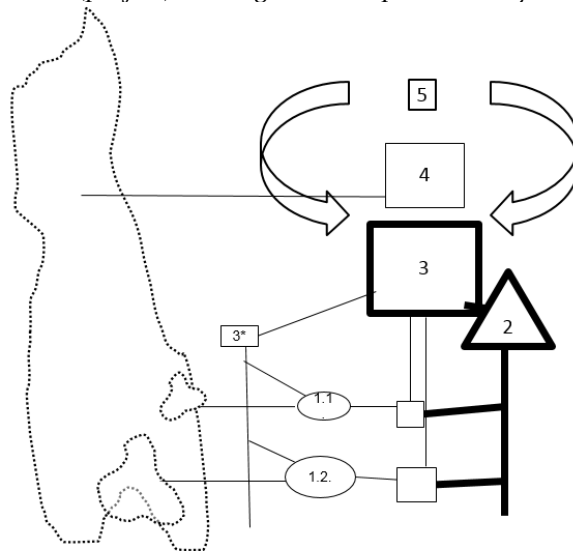
In a sound strategy process, the purpose of the organization in terms of Peter Drucker's most prudent question of management ("What business are we really in?") has to be clarified. A common understating of the answer to this question is prerequisite for an organization to achieve effectiveness (Beer, 1994; Drucker, 1990). As described earlier on, an agreed frame of reference has to be established via a common language that commands sufficient variety to cope with all of the issues of the organization in its internal and external interactions.

This strategy process cannot be discussed here in any detail but it needs to be understood that the main point of external and internal evaluation is the so-called customer-benefit-analysis that in accordance to Schwaninger (2009) and Gällweiler (1990) revolves around "The Solution-Invariant Definition of the Customer Problem". A properly done strategy process scrutinizes the organization's management more than anything, to come up with a shared and integral frame of reference of the "what do we do", in terms of customer benefit. This is constantly compared with the markets frame of reference until a dynamic flow-equilibrium between the two is established.

In this process, two areas have been identified as critical: (i) business focus and (ii) internal cohesion.

It has been identified that this company's market is dominated by customer's demand for innovative solutions, quick response times and high customization and design capabilities. Due to these findings, it was established that company (A) would be more effective if organized along the lines of market-driven business units rather than by functions. Now, since the organization's system 1s are purely project driven entities (see Figure 2) and their relevant environments are the respective current project as ordered by some customer (as soon as the project is completed the resources used to deliver the project disintegrate and are allocated anew to other projects), a new central function, called "Resource Planning", was implemented to achieve an improvement in the interaction between system 1s and system 3. This system, supposed to be fully aware of the needs of each business units ("what do we do"), monitors the resource allocation across BUs and plans and balances workloads and capacities. In this respect, project management and the supporting IT system are the key factors determining the coordination of the whole and had to be set up in such a way that enables them to deal with the fast-changing system 1s due to the project-based feature (see Figure 2). With these prerequisites company (A)'s new project management system started improving the reliability of planning, the effectiveness of control on financials and the monitoring of physical progresses in order to highlight delays and extra-costs with regards to their impact on customer-benefit.

**Figure 2.** The proportions of the management and operations of the system 1s and their respective environment (project) with regards to requisite variety are aligned



Note: System 3\* with its original function of audit, for which it had to become leaner and more agile in order to keep up with the fluctuating design of the project based system 1s.

It needs to be emphasized that the alignment of system 2 (IT, controlling, workload planning...), which now has proper access to the system 1s and actually supports them in their fulfilment of the whole's purpose, was only made possible by

clarifying the overall strategy of the organization in equilibrium with its environment's demands. A simple intervention in terms of interface or process alignment between IT and business would not have done the job.

In addition, the SiF now has some model of its “whole” self, which is more than the sum of its parts, in its overall environment. This is indicated in Figure 2 with a system 4 that has become “larger” and is now in exchange with the whole strategically relevant environment of the company.

Lookout:

Having balanced the grade of complexity between market environment and operations, company (A) now faces the next challenge: re-balancing the complexity equation between operations and the management of the SiF in order to safeguard the cohesion of the whole against oscillating centrifugal and centripetal forces.

Looking at Figure 2 it can be clearly seen that in this first intervention, while creating a common frame of reference and by that eliminating the most pressing issue of value creation, it was not achieved, neither was it attempted in the scope of this first step, to eliminate the problem of micromanagement and missing governance guidelines. Even though there is less direct intervention through system 3\*, systems 2 and 3 are still very much concerned with detailed operational control.

While relative autonomy of the system 1s is at the moment established, the SiF's management needs to see to it that a proper flow-equilibrium between the systems 3 and 4 is established and maintained. At the moment this exchange is not happening properly and therefore the SiF lacks variety in its own management functions, strategic guidelines for the operations of the system 1s are missing and are still “replaced” with detailed operational control.

In fact, the most powerful management mechanism, the function of normative governance, is not working at all and systemic closure is not achieved. Only with strong normative and strategic guidelines can the SiF achieve self-organization and abandon operational detail control and sustainably fulfil its business purpose.

## 6. CONCLUSION

Classic approaches to organizational theory and practice treat organizations as trivial machines and therefore fail to address the most prudent questions of management “what do we do”. This way IT resources become employed in obscure ways that are more often done for the sake of IT than for the benefit of the whole organization. Since organizations are complex systems all management approaches need, by law of nature, to be complex as well.

Notwithstanding certain limitations to this research, represented by a lack of literature published in recent years and a limited number of real case applications, it can be safely stated that the VSM as proposed by Stafford Beer serves as a powerful solution to these questions. In order to successfully use any kind of practical model for the management of an organization, a solid frame of reference needs to be established. Once managers have gained an understanding of the questions of subjective relativity and recursivity, they can engage in discussing organizational matters on the basis of a shared and consistent theory of the organization. The consistent frame of reference, respectively the process of the discussion of this frame then needs to be sustainably integrated.

The language of classical business administrative nomenclature does not yield access to an integrated discussion of the respective organization with regards to the characteristics of operational, strategic and normative specifications of an organization. The classic approaches lack requisite variety to depict the actual mechanisms of all constituting components of the organization while pushing towards an objective understanding of the organization. Cybernetics provides a language with requisite variety for the discussion of such matters while respecting the subjective nature of all observations.

## REFERENCES

1. Allen, P., & Varga, L. (2006). A co-evolutionary complex systems perspective on information systems. *Journal of Information Technology*, 21, 229-238.
2. Beer, S. (1994). *Brain of the Firm* (2nd edition). New York: John Wiley and Sons Ltd.
3. Beer, S. (1994). *The Heart of Enterprise*. New York: John Wiley and Sons Ltd.
4. Conant, R., & Ashby, G. (1970). Every good regulator must be a model of that system. *International Journal of Systems Science*, 1(2), 89-97. <https://doi.org/10.1080/00207727008920220>
5. Drucker, P. (1990). *Managing for Results*. Oxford: Butterworth Heinemann.
6. Einstein, A. (2006). *Relativity: The Special and General Theory*. New York: Penguin Group (USA) Inc.
7. Gälweiler, A. (1990). *Strategische Unternehmensführung* (2nd edition). Frankfurt/New York: Campus.
8. Hawking, S., & Mlodinow, L. (2010). *The Grand Design*. New York: Transworld Publishers.
9. Schwabinger, M. (2009). *Intelligent Organizations* (2nd edition). New York: Springer-Verlag.
10. Von Foerster, H. (2003). *Understanding understanding: Essays on cybernetics and cognition*. New York, Springer-Verlag. <https://doi.org/10.1007/b97451>