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## Functional analysis of organizational designs

### INTRODUCTION<sup>1</sup>

How should we analyze the design of an organization? Imagine, for example, that we are asked to provide an analysis of a large bank. Let us assume that the task is to provide an analysis to help the leaders of the bank evaluate whether the current organizational structure is an appropriate one, given the organization's particular strategy and purpose. Which tools should we use in the analysis? Which theoretical models should we rely on? How should we present our conclusions?

In the organizational theory literature (e.g., Morgan, 2006; Scott, 1995) there are numerous concepts and frameworks that may be used to characterize the *overall type or form* of organization that we are dealing with. As an example, using Mintzberg's (1979) typology, we may conclude, for example, that the bank resembles a machine bureaucracy, that it is highly centralized, and characterized by a high level of formalization with regards to its processes and procedures.

However, organizational theory is generally descriptive; it provides few normative guidelines for the analysis of a specific organization. The initial task for a practitioner may certainly be to describe the current organization. But the subsequent tasks are usually more challenging: To determine *whether the current structure is an appropriate one*, given the purpose or strategy of the specific organization, and to suggest *how the design might be improved* to attain a higher level of effectiveness.

We may instead turn to the strategy literature, which is typically more prescriptive in the sense that it assumes that the formal structure of an organization should be aligned with its strategy, and that the implementation of a new strategy may require changes in the formal (as well as informal) structure of the organization<sup>1</sup>. Some strategy textbooks (as well practitioner books) also propose specific organizational designs that support different strategies or external contingencies, for example, a multidivisional structure for a firm pursuing diversification, or a market based structure for a firm that seeking to increase customer orientation (e.g., Johnson, Whittington, & Scholes, 2009).

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<sup>1</sup> *Acknowledgment:* I would like to thank Alexander Huun for his contribution to the case example in this article.

However, this literature seems to assume that organization design is a matter of selecting a pre-existing organizational form that fits certain external or internal contingencies. Studies of actual design processes show that new designs are developed in response to a set of requirements that are unique to each organization (Yoo, Boland, & Lyytinen, 2006). Hence, when evaluating the current design of an organization, it is not sufficient to characterize the overall type or form of organization; one must consider the more specific design choices that have been made to address the particular requirements facing the organization.

In this article, I describe a new analytical approach called *functional analysis*. The key assumption is that one should start by considering the organization's overall purpose. One should then consider the more specific *functions* that the organization performs – that is, the *desired outcomes* that the organization seeks to achieve. Once the functions have been understood, one can identify how the organization has been *structured*, that is, the units, roles, processes, and formal reporting structures that have been implemented *to fulfil* the functions. With this understanding, one may be in a position to evaluate *whether the organization has an appropriate design, given its purpose*, and to propose an alternative design that would be better aligned with the purpose.

It appears that some practitioners intuitively use a functional approach when considering the design of an organization. When asked to explain the units shown on an organization chart, most managers will describe the key functions of the boxes, even though they may not be stated in writing: “A key function of the treasury unit in our bank is to provide funding for the retail and corporate banking divisions”<sup>ii</sup>.

However, after having studied the methodologies of several consulting firms and academic authors (e.g., Burton, Obel, & DeSanctis, 2011; Kesler & Kates, 2010; Nadler & Tushman, 1997), I have yet to find an organization design methodology that includes the *explicit* definition of functions; some state that one should identify the organization's “capabilities”, but there is usually no tool for mapping the (usually high level) capability definitions (i.e., ends) to specific design parameters (i.e., means). A key aim of this article is to describe such a tool.

The functional approach is based on well established concepts in systems theory, which I will review shortly, and as mentioned, many practitioners (e.g., consultants, managers) will intuitively employ some of these principles. However, the functional approach is not described in the mainstream literature and, as mentioned, not included as part of most consulting methodologies.

The functional approach does bear some resemblance to tools used for “accountability mapping”, such as the well-known RACI framework and the more recent refinement named RAPID (Rogers & Blenko, 2006). However, these are tools that have little theoretical justification and that are usually applied to clarify individual roles and responsibilities during the implementation phase of an organization re-design process, after the overall organizational model has chosen. In contrast, the functional approach can be applied in any phase of a design process (from initial analysis to design and implementation of a new organizational model). Moreover, the functional approach can be applied at multiple levels: It can be used to define functions at the organizational, sub-unit, or individual (role) level. Most importantly, the functional approach contains design principles, grounded in theory, that one may rely on to ensure that one develops an effective organizational model (i.e., one that maximizes the chance of realizing the design intent).

The remainder of this paper is structured as follows. I first review the theoretical basis of functional analysis. I then describe a brief case, from a financial services group, where the approach was piloted. Finally, I discuss strengths and limitations of the approach.

## THEORETICAL BASIS

Functional analysis is derived from general principles described in systems theory (Ackoff, 1971; Ackoff & Emery, 1972) and the more specific tools and principles in axiomatic design theory, which was developed by engineering professor Nam Suh (1990, 2001).

A key premise in systems theory is that each organization has a purpose, which we may operationalize by identifying more specific functions (Ackoff, 1971, 1999)<sup>iii</sup>. We may define a function as the *intended outcome* that an organization produces. Each unit within the organization also has a function,

and it may be necessary to achieve all of the unit-level functions if the organization is to achieve its overall purpose. A function is *fulfilled by* a structure, yet function and structure are separate from each other conceptually. Ackoff & Emery (1972) provided the following example to illustrate this point: A sundial, a water clock, a spring watch, and an electric clock all produce time-telling and hence have time-telling as their function, although they are structurally different.

Some common functions of organizations are to “sell and market products or services”, “develop and deliver products and services”, and “provide administrative support to internal units”. Such high-level functions may be decomposed into more specific functions related to, for example, the marketing of a specific product in a specific region or toward a specific customer segment. Although functions as defined here may in some cases be translated into short-or medium-term objectives or goals for an organizational unit (e.g., “Increase our market share for mortgage loans to 20% by 2016”), functions typically represent more enduring aspects of the organization (i.e., as expressed in the mission, mandate or charter of an organization or sub-unit).

By and large, the mainstream literature in organization theory (or design) largely ignores this distinction between function and structure (Gresov & Drazin, 1997). Yet there are some exceptions. One example is the literature on the role of headquarters (e.g., Kono, 1999; Young et al., 2001), which reviews alternative headquarter functions, such as “developing strategy”, “identifying potential synergies”, “allocating resources”, or “monitoring subsidiary performance”. Yet this literature does not consider the interrelationships between the functions, and does not explicitly map functions against structure, i.e., it does not discuss how to allocate the functions to specific units or roles within the headquarters. This is a key element of functional analysis as described here.

Now let us briefly review Axiomatic Design (AD). AD was originally developed for the engineering sciences by Nam Suh (Suh, 1990, 2001). But it shares many assumptions with systems theory in the social sciences. At the same time, AD contains more specific tools and principles for representing and improving the design of complex systems.

As assumed in contingency theory (Donaldson, 2001) and in institutional theory (Scott, 1995), every organization must conform to contingencies or functional demands, which may either be internal (strategic priorities; employee expectations) or external (customer requirements, new regulatory frameworks). These contingencies determine the functions that an organization must perform (Gresov & Drazin, 1997) or, in AD terms, the *functional requirements* (FRs) that must be satisfied<sup>iv</sup>.

Thus an organizational designer must interpret the contingencies that the organization is subjected to, and identify a set of functions that address the contingencies. The next step is to identify how the functions are to be satisfied (i.e., to design the structure). This involves identifying a set of “design parameters” (DPs). In a product, a design parameter is typically a physical component, but it may also be an intangible element such as software code. A design parameter for an organization may be a permanent unit, but it may also be a temporary project, or an individual role, if the role is uniquely responsible for fulfilling a functional requirement. Worren (2012) suggested that a design parameter should always involve the designation of an *accountable role or unit* (e.g., a unit whose leader will be held responsible for the fulfilment of the FR), yet the unit (“DP”) may be a department, project, process, role, or some other organizational entity<sup>v</sup>.

As with product design, organizational design starts by identifying higher level functions and proceeds by decomposing the functions and the design parameters until one has a design that can be implemented. In other words, one might start by identifying “a firm” as the top level design parameter, and continue until one has identified organizational units, departments, and individual roles<sup>vi</sup>.

According to AD, this interplay between function and structure is the very essence of design: In the design process, one starts by identifying “what one wants to achieve” (the functional requirements (FRs)), and then considers “how one chooses to achieve it” (the design parameters (DPs))<sup>vii</sup>. The key elements of the design process are illustrated in Figure 1, which lists the terms used in Axiomatic Design as well as similar terms that broadly refer to the same concepts.

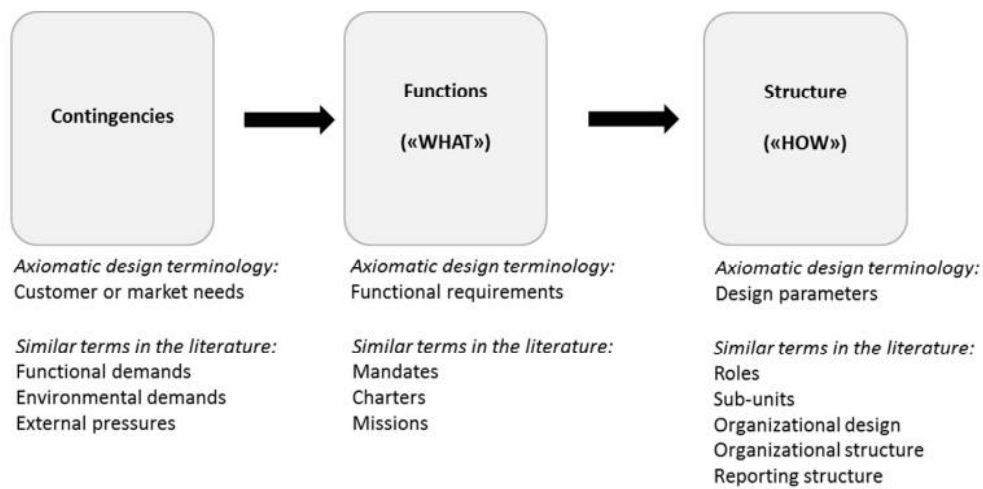


Figure 1. Key elements in a design process according to Axiomatic Design (AD) with references to alternative terms that may refer to the same concepts.

As indicated in Figure 1, there is in principle a sequence where DPs are defined after the FRs have been identified. However, to some extent designers will (and should) iterate between FRs and DPs while they are developing the design. The reason is that the choice of a particular DP at one level may suggest the need for a particular FR at the next level of a (functional) hierarchy. For example, if a bank decides to outsource its back office activities, this may at the next level of decomposition imply the need for a functional requirement related to the selection or monitoring of an outsourcing partner, whereas this FR is not be relevant if the bank selects a different DP, e.g., if it chooses to insource the back office processing activities.

Unlike most of the current theories within the organizational sciences, the axiomatic approach is a *prescriptive* theory. However, it is not prescriptive in the traditional sense of favouring certain pre-existing solutions (i.e., specific organizational models). The intention is to provide scientifically based theory for improving the *process* of design and, as a result, improving the design of systems. Suh (1990; 2001) proposed two main *axioms* as well as a number of corollaries and theorems (inferences derived from the axioms) aimed at guiding design processes. The first is the *independence axiom*, which states that one should always maintain the independence of functional requirements. For a product, this means that one should be able to adjust a design parameter to satisfy its corresponding functional requirement without compromising the ability to satisfy other functional requirements. In

the organization design context, this may be interpreted as ensuring that the design allows organizational units to make decisions and undertake activities to fulfil their corresponding functional requirements without negatively affecting the ability of other units to fulfil their particular functional requirements (Worren, 2014).

The second is the *information axiom*. The precise meaning of the information axiom cannot be directly generalized from technical to social systems, but it is essentially a criterion for (among otherwise acceptable alternatives) selecting the design alternative with the highest probability of implementation success. The probability of success may be affected by the number of functional requirements and the interrelationships between functional requirements and design parameters (i.e., design complexity) as well as by the maturity level of the organization (a more mature organization may be able to implement a more complex/i.e., information intensive design).

To operationalize his theory, Suh (2001) proposed the use of a so-called *design matrix*, which is a table where FRs are mapped against the DPs. An “X” is used to indicate that a design parameter contributes (strongly) to the fulfilment of a FR (see Table 1a and 1b). If the design conforms to the independence axiom, there will only be “X”s along the diagonal in the matrix. When two or more design parameters have an impact on the same FRs, the FRs are not independent, which Suh (1990, 2001) referred to as *coupling*<sup>viii</sup>.

Table 1a illustrates a classic issue in matrix organizations (Daft, Murphy, & Willmott, 2014). It lists two product units that are measured on overall product profitability, and two sales units that are measured on revenues within a geographical area. The FRs are potentially coupled. This is because actions taken by a product unit to satisfy its FR may negatively affect the ability of the sales units to satisfy their FRs (and vice versa). For example, in order to increase profits, the head of product unit A may ask a subsidiary to prioritize its product, but this may have a negative effect on the overall revenues for the sales unit (e.g., if product A addresses a smaller market segment than product B in the region). There may also be coupling between FRs of the product units themselves (e.g., if the products are substitutes or if the units compete for limited production capacity).



[INSERT TABLE 1A ABOUT HERE]

[INSERT TABLE 1B ABOUT HERE]

When two or more independent functions are coupled, there are several ways in which they can be decoupled. The first is *structural separation*. There is a continuum of structural separation – from complete, legal separation to internal, administrative separation of functions between two roles or units within the same organization. In a typical matrix structure, as illustrated in Table 1a, there is already structural separation (i.e., the organization has been divided into products and sales units). However, these units have overlapping and potentially contradictory functional requirements. The overlap can be removed (or at least significantly lessened) by redefining the functional requirements (Worren, 2012). For example, the product units can be measured on quality or delivery time, and the sales units on sales volume or market share. This is illustrated in Table 1b. In other cases, there may be coupling between two roles or activities that belong to the same sub-unit in the organization. The solution in such cases may be to transfer one of the roles or activities to another sub-unit (or in AD terms, allocate one of the FRs to another DP). In some cases, it may also be possible to introduce *temporal separation*. For example, an IT department may find that there is a conflict between its short-term activities, related to correcting technical errors, and its longer term application development activities. But employees may spend four days a week addressing errors and reserve one day a week for application development.

The assumptions behind the independence axiom are consistent with several schools of thought in the field of management. In the strategy and operations literature, a well-known proposition is that sub-units (e.g., subsidiaries or business units) with a *focused strategy* will perform better than sub-units with an unfocused strategy (Porter, 1980). The main assumption is that unfocused strategies imply that the organization will need to perform a “set of conflicting or competing activities (...)” (Huckman & Zinner, 2008, p. 177). The concept of coupling is also similar to *conflict of interest* in ethics and legal theory (e.g., Luebke, 1987; Argandoña, 2004), *goal conflict* in the principal agent literature (e.g., Eisenhardt, 1989), *role conflict* in sociology and administrative theory (e.g., Rizzo et al., 1970)<sup>2</sup>, and *overlapping jurisdictions* in political science and law (e.g., Gregg, 1974). More broadly, the importance of recognizing conflicting goals and requirements has been recognized by several authors and is central in *issue based strategy formation* (Nutt & Backoff, 1993) and *dialectical inquiry* (Mason & Mitroff, 1981).

When utilizing AD for organizational analysis, as we do here, we need to acknowledge that the actual design may depart from the original intent. Jaques (1989) distinguished between three alternative descriptions of an organization: The manifest organization (how it is presented), the extant organization (how it actually works), and the ideal organization (how the organization should be designed to achieve its purpose). Official documentation may show the functions that the leaders would like the organization to perform, but these are not necessarily the functions that the organization *actually* performs or *should* perform. In the same manner, the particular allocation of functions described in official documentation may not be the actual allocation of functions among sub-units in the organization. One implication is that one is dependent upon access to key members of the organization in order to gather valid information for this type analysis.

## EXAMPLE OF APPLICATION

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<sup>2</sup> See Worren (2014) for an in-depth discussion the concept of coupling and a comparison with existing concepts in the literature.

The approach outlined above was piloted in an engagement for a large financial group with approx. 14 000 employees. This group provides retail and corporate banking services as well as insurance products to customers in the Nordic region. The mandate for the project was to review the financial group's governance structure, including the roles of the main units within the group.

Prior to the engagement, the bank had developed and distributed a corporate governance document that described the bank's formal organization, the main roles or mandates of the key units as well as decision forums and processes. However, the leadership team decided that there was a need for further clarification of the roles of the main units. The author collaborated with an internal consultant from corporate staff and was also given access to data that was collected in interviews with 12 managers representing each of the main units in the group. The same managers also participated in providing feedback to draft reports throughout the project. An excerpt of the interview guide is shown in Table 2.

[INSERT TABLE 2 ABOUT HERE]

The information gathered from these interviews was used to define a statement expressing the bank's overall purpose and the more detailed functional requirements. Several iterations were required to

arrive at formulations that were deemed to be sufficiently precise. But eventually, one agreed on a definition of the group's key purpose that read as follows:

FR<sub>1</sub>: Maximize economic profit by providing financial services

This overall purpose was broken down into five more detailed functional requirements (FRs):

FR<sub>11</sub> = Sell financial products and services

FR<sub>12</sub> = Develop financial products and services

FR<sub>13</sub> = Provide support and delivery capacity (branches, online banking services, etc.)

FR<sub>14</sub> = Manage risk, secure funding, and allocate capital

FR<sub>15</sub> = Ensure compliance to guidelines, policies

Collectively these five FRs represent outcomes that the bank must achieve in order to satisfy the top level requirement (FR<sub>1</sub>). The five FRs were further decomposed into 35 lower-level FRs (i.e., FRs related to the provision of different types of products, customer segments, etc.).

The next question was how these FRs are fulfilled. The financial group consist of 12 organisational units that performed the functions described. In the governance document referred to above, the units had been grouped into three main categories (see Figure 2):

DP<sub>11</sub> = Business areas

DP<sub>12</sub> = Support units

DP<sub>13</sub> = Staff units

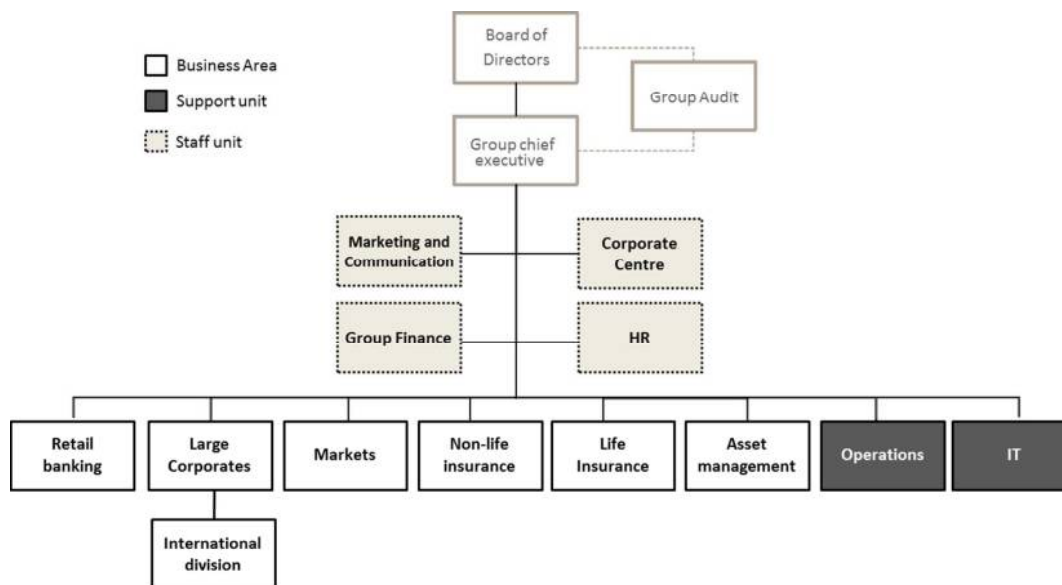


Figure 2. The financial group's structure as presented in the governance document.

In the governance document, it was simply stated that the units had been allocated one of the three main roles – business area, support unit, or staff function. An initial goal in the project was thus to examine more carefully the extent to which this intended allocation of roles (i.e., functions) had actually been implemented. This implies an analysis of the *correspondence* between FRs and DPs. The data that was collected from the various units in the financial group is summarized in the design matrix in Table 3.

[INSERT TABLE 3 ABOUT HERE]

The client representative created a diagram (reproduced in Figures 3-5) that provided a visual format for communicating the same information. This format is easier to grasp initially, and thus more suited in a presentation or workshop setting. At the same time, it is less precise than the design matrix (A consultant or facilitator may convert these kinds of diagrams into a design matrix as a way of summarizing the discussion and confirming the main conclusions from a workshop.)

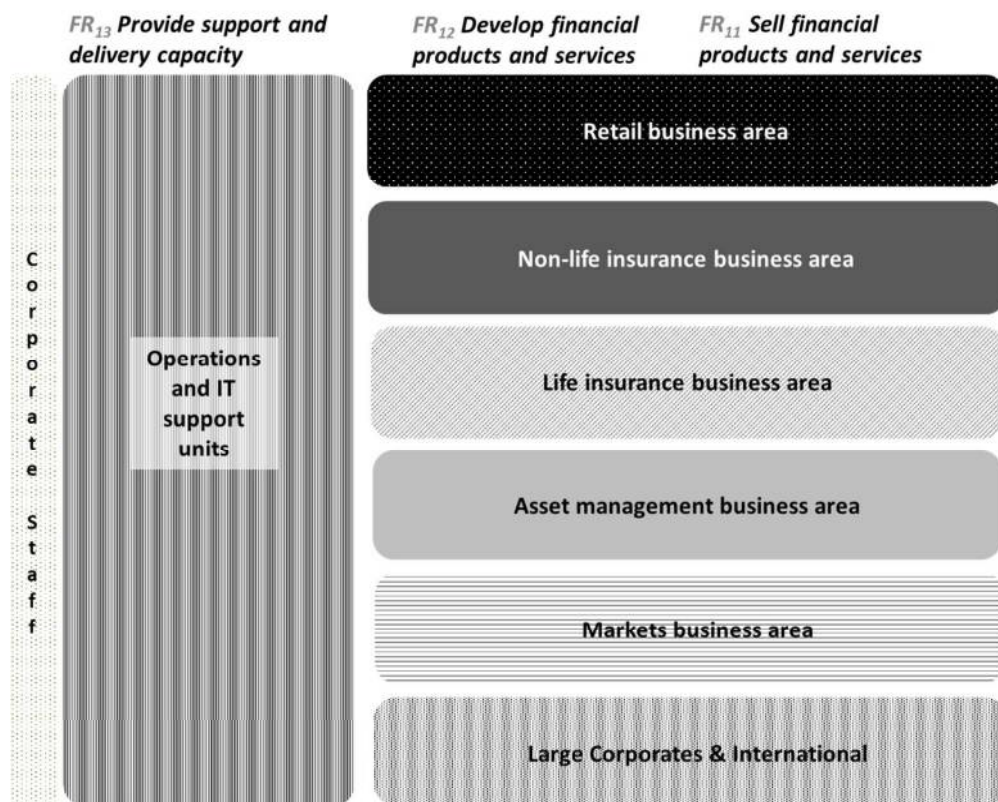


Figure 3. Illustration intended to convey the current allocation of functions based on the official governance document in the financial group (Note that only three of the five main functions are included).

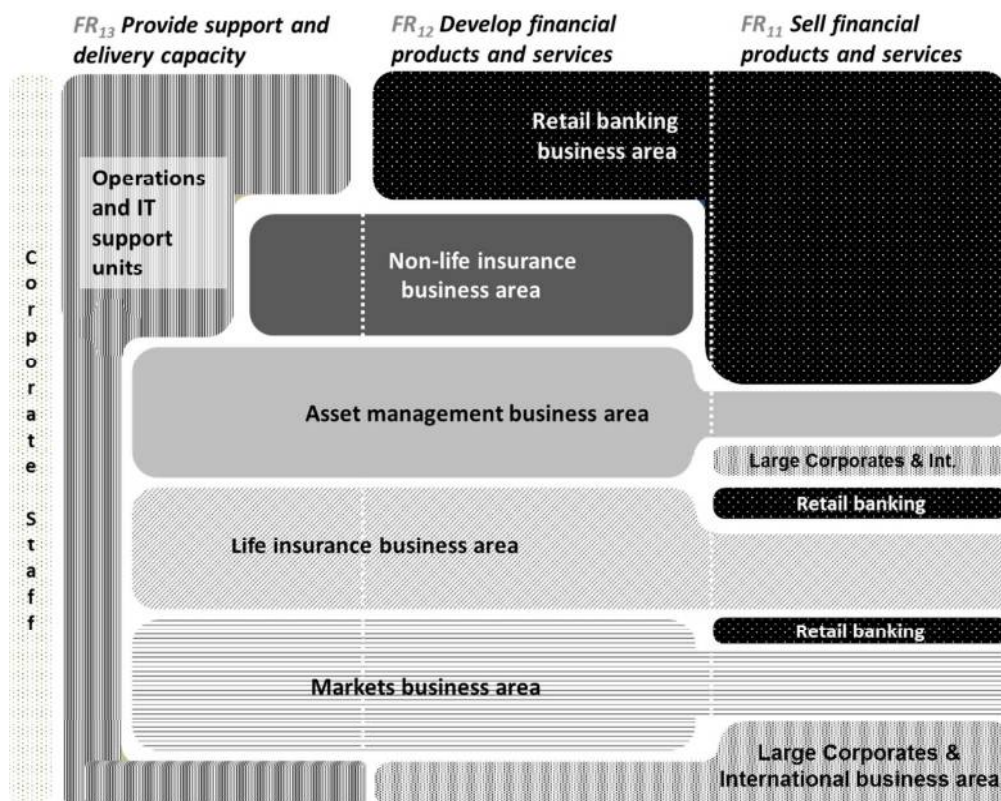


Figure 4. Illustration intended to convey the actual allocation of functions in the financial services group based on information from interviews (compare with Table 3 and Figure 2 above). The size and placement of each box have been adjusted to reflect the relative size and focus of the units (Note that only three of the five main functions are included).

Based on the interviews, it was confirmed that the financial group had adopted a structure that in many respects seemed to be in line with “best practice”. It had a logical subdivision into different business areas. It had established a shared services unit and was in the process of standardizing transactional processes. It had established a comprehensive risk management process and had clearly defined responsibilities for managers at different levels.

At the same time, five observations were made regarding possible discrepancies between the official organization chart presented in the governance document (Figure 2) and the actual allocation of roles (The numbers below correspond to the circles superimposed on Table 3):

- (1) From the official chart, it would appear as if the bank’s Operations and IT units (defined as support units in the governance document) provided transactional services to the entire

bank. Yet the interviews made it clear that these units only provided full support to one business area (except for some less important services); the other business areas had their own operations and IT departments that provided transactional support services. Hence in the design matrix (Table 3), it is indicated that Function 1.3 (“Provide delivery capacity”) is also performed by business areas and staff units, in addition to support units (as intended).

- (2) It was also found that some support units performed a policy role (in addition to their support role) and thus influenced the ability of the financial group to define and implement appropriate guidelines and policies (FR<sub>15</sub>). As an example, the IT unit would not only provide IT services to business areas but also be responsible for developing and ensuring compliance with the IT policy.
- (3) Several of the staff units provided support in addition to performing corporate staff activities. For example, Group HR was not only responsible for defining and implementing the HR policy, but also for providing support to business units in recruitment processes (e.g., Group HR participated in screening job candidates).
- (4) Two of the units defined as staff units in the governance document (Group Finance and Marketing) influenced the ability of the bank to fulfil the FRs related to sales and delivery capacity. For example, the Marketing unit had been given the responsibility for managing the group’s web site (which may be viewed as a “virtual branch”).
- (5) There were in reality different variations of “business areas” due to different channel/distribution strategies. The business areas would generally develop and distribute its own products, sometimes complemented with products from other business areas. But one business area - Non-life insurance - relied on the Retail banking business area to sell/distribute its products, and was only responsible for developing and providing back-office support for its own products.

These observations pointed to some discrepancies between what Jaques (1989) termed the *manifest* organization (the one officially described) and the *extant* organization (the actual allocation of



functions across units). The overlaps and combinations of functions indicated in Table 3 also represent potential instances of *coupling* as defined in Suh (1990; 2001), that is, non-conformance with the independence axiom. In interviews with managers in the bank, it was clear that the instances of coupling led to an increase in (perceived) complexity and in some cases were related to important organizational challenges.

One manager in a support unit explained that the support role that it had been allocated involved specific deliveries based on requests from business areas (such as providing access control systems for branches). However, the staff role that it had also been given required the unit to develop (and oversee the implementation of) general guidelines for all units (such as security standards). The manager noted that the combination of such roles would at times result in goal and role conflicts. He also noted that the *legitimacy* of a unit would sometimes be questioned if the unit was simultaneously perceived by managers elsewhere in the group to be a both supplier and a policy maker (e.g., line managers may suspect that its policies favored the access control systems that the support unit itself had procured).

Managers in the Operations unit remarked that it was hard for the unit to fully implement the financial group's cost reduction strategy (which it had been made responsible for) as the Operations unit did not have direct control of most of the sub-units that provided transactional banking services in the various business units (as described above, most of the business areas had dedicated operations and IT sub-units).

It was also observed that the differing channel/distribution strategies would sometimes create asymmetries between business areas and a need for complicated incentive schemes to ensure that products developed by one business area would be given priority in the sales and marketing process in another business area alongside the products that had been developed internally in the same business area.

An important goal in the axiomatic design approach is to develop guidelines for simplifying complex designs. As mentioned above, a key axiom is that designers should strive to maintain the

*independence* of functional requirements. One should note that this does not imply that there should be no operational interdependencies between design parameters (i.e., between the different units in an organization). As an example, financial products must first be developed (and then implemented, by reconfiguring IT systems, providing training to staff, etc.) before they are sold to customers. The units responsible for developing and selling products need to interact with each other. Thus they are clearly dependent on each other from an operational point of view. Yet they may still be *functionally independent* (i.e., it should be possible to avoid *coupling*, as described above). As an example, this means that the ability of support units to maximise their FRs (e.g., “perform banking transactions with a high degree of efficiency”) should not compromise the ability of a business area to fulfil its FR (e.g., “maximize product profitability”), and vice versa.

As part of this engagement, a “decoupled” organizational design of the financial services group was proposed (broadly based on the principles proposed by Ackoff, 1999) as an alternative to the current organizational structure of the financial services group. Instead of the three main units in the current organization, it was proposed to distinguish between four units:

DP<sub>11</sub> = Sales units

DP<sub>12</sub> = Product units

DP<sub>13</sub> = Support units

DP<sub>14</sub> = Staff units

It was further proposed to allocate the functional requirements differently as shown in the design in Table 4 and illustrated visually in Figure 5.

[INSERT TABLE 4 ABOUT HERE]

To implement this design, the financial group would have to reallocate the unit mandates. First, it would have to create separate sales units (responsible for distributing all products). The sales units could be grouped either by geography or customer segment (e.g., consumers, small businesses, large corporates). Secondly, the responsibility for product development and management would have to be allocated to specialized product units. Thirdly, it would have to consolidate all transactional processes in the Operations and IT units. Finally, it would need to separate staff and support roles by removing policy responsibility from the support units. This design may potentially be a decoupled design in that it removes most of the interdependencies (instances of coupling) identified in Table 3<sup>ix</sup>.

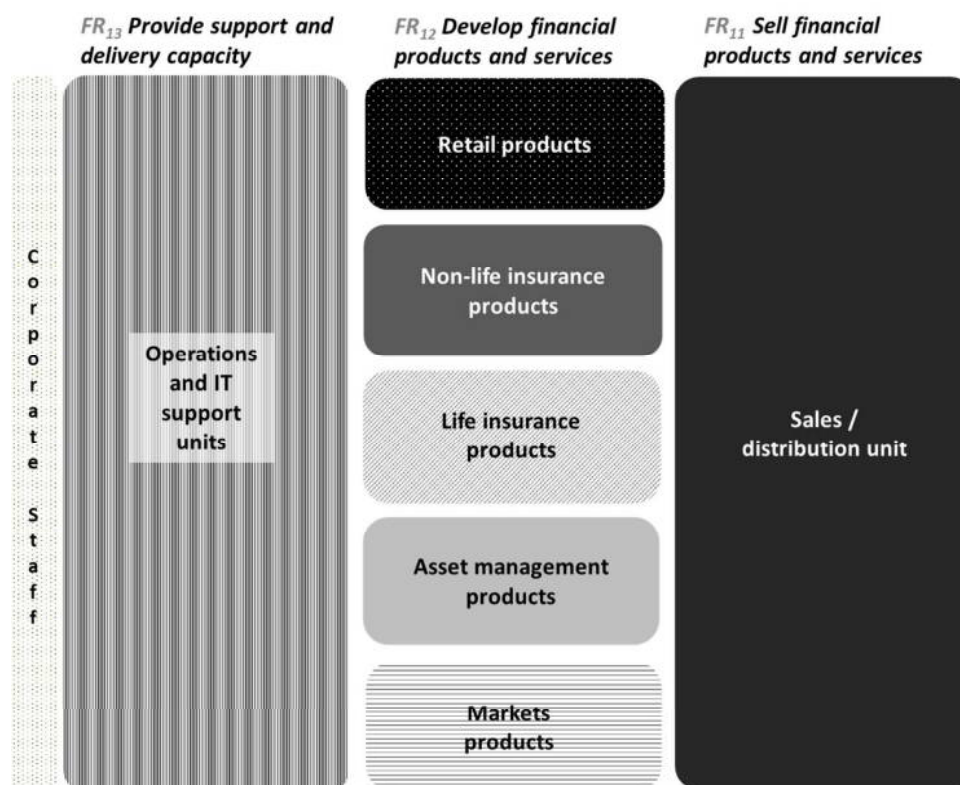


Figure 5. Illustration intended to convey an alternative, decoupled allocation of functions in the financial services group (compare with Table 4 above and with Figure 4) (Note that only three of the five main functions are included).

The proposed model was included in the final report of the project, which was delivered and presented to the group's CFO. A detailed evaluation of the advantages and disadvantages of the proposed model is beyond the scope of this article, but the client observed that a decoupled design would confer a number of potential benefits. First of all, it would reduce the role conflicts inherent in the current model. The client also remarked that it might provide a chance to formulate more clear cut goals and KPIs, in that product units might be measured on product profitability, and sales units on market share and customer profitability. The client also noted that such a model was "modular" and thus might provide greater scalability, in that individual units might more easily be added or removed without the need to make fundamental changes in other parts of the organization.

## DISCUSSION

The case example illustrates how the organizational structure of a financial services group was analyzed using a functional approach. Our observations from this pilot application was that the functional approach conferred several benefits. It made it possible to create an explicit link between the financial group's overall mission and its organizational structure. It thus provided a way of bridging conceptual thinking (regarding high level functions) and operational detail (design parameters) (cf. Cotoia and Johnson, 2001). The financial group's governance document did not distinguish between the official and the actual allocation of unit roles or mandates (or between the manifest and the extant organization (Jaques, 1989)). The functional analysis clearly identified discrepancies between the two. The approach also legitimized a discussion of overlaps and contradictions with regards to unit roles or mandates (i.e., coupling). It has recently been confirmed empirically that such overlaps and contradictions are associated with an increased level of conflict between managers belonging to the units that are interfacing with each other (Wolf & Egelhoff, 2013).

Several limitations should also be acknowledged. The pilot application involved a relatively small number of interviews. The design matrix that was developed in this case (Table 3) was solely based on interpretation of the interview data. The proposed alternative design (Table 4 and Figure 4) was also based on interpretation and conjecture. It was not fully operationalized or tested during the project. Ideally, one would collect more extensive, and perhaps quantitative, data. In particular, one might try to develop empirical methods to assess the existence and severity of coupling (cf. Worren, 2014).

There are a number of prerequisites for the successful application of the functional approach. It may initially be perceived as complex and abstract. Some of the participants may not see the immediate benefit of the analysis and prefer to use more familiar tools or frameworks. The consultant or facilitator who employs this approach needs to be able to “translate” between the more abstract functions and the organizational design parameters.

Haeckel (1999) noted that what people sometimes refer to as “semantics” actually matter a great deal when describing why an organization exists and what it does. The manner in which each functional requirement is formulated is based on the assumptions that one makes, and will have particular implications for the subsequent analysis. In the case example described here, it was assumed that selling a financial product or service is distinct from developing the same financial product or service. There were two reasons for making this assumption, first, the bank had already introduced such a separation with regards to one product (non-life insurance), which was developed and delivered by one business area and sold by another (and there were several other examples of cross-selling across the business areas). Secondly, it is relatively common to use intermediaries to distribute and sell many different financial products and services, which also confirms that it is possible to introduce such a distinction. This led to the formulation of two different functional requirements:

FR<sub>11</sub> Sell financial products and services

FR<sub>12</sub> Develop financial products and services

Yet product development and sales are intrinsically related in some industry sectors. One can imagine some types of intangible services (e.g., consulting, advisory services) for which it may be difficult to separate the function of developing the service from the delivery of the service. Similarly, for some complex financial or technical products, it may be difficult for somebody who has not been participating in the development of the product to explain how it works to a customer and thereby be able to sell or market the product. In a bank, it may also be inappropriate to completely separate sales and product development from a risk management perspective (i.e., it may lead to difficulties in assessing and monitoring operational risk<sup>x</sup>). If so, the two elements should be integrated in the same functional requirement:

FR<sub>11</sub> Develop and sell financial products and services

Hence there may be alternative interpretations of every functional requirement. This linguistic flexibility may, on the one hand, create some difficulty, and typically results in the need for multiple iterations before the participants agree on a set of requirements that they feel describe their current organization. On the other hand, it may also be seen as a strength in that it may help the participants in clarifying important premises and assumptions and thus lead to a better definition of the design goals.

The main purpose of the article was to discuss analysis or evaluation of the current organizational structure. For this reason, it concentrated on one of the two axioms in Axiomatic Design (AD): The independence axiom. However, in a re-design process where one is developing a new organizational model, the second axiom, the information axiom, is also important. As stated above, this axiom states that one not only should consider whether the design is optimal from a functional perspective, but also whether it is implementable given the organization's resources and level of maturity.

## CONCLUSION

Current organizational theory is mainly descriptive and provides generic, high level typologies. In contrast, functional analysis provides an approach and a tool for identifying *firm-specific* functional requirements. It also provides a methodology for evaluating the degree of correspondence between functional requirements (ends) and organizational design parameters (means), and for identifying

inconsistencies and overlaps with regards to functions. The key benefits are to increase the analytical rigor of the process of organizational analysis and to provide a practical yet theory-driven approach that can be used to guide organization design decisions.

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## ENDNOTES

<sup>i</sup> The need to align the formal structure with external and internal contingencies is the key assumption in contingency theory, a strand of organizational theory (see Donaldson, 2001 for an overview).

<sup>ii</sup> However, we should note that among practitioners, the term “function” is also used for “department” or “sub-unit”. In this article, “function” is used exclusively to denote “functional requirement”, as expressed in an organization’s mission, mandate, or charter.

<sup>iii</sup> Ackoff (1971) described organizations as purposeful and ideal-seeking systems, that is, systems which, on attainment of any of its goals or objectives, then seek another goal or objective which more closely approximates its ideal. They also differ from other systems such as organisms or mechanical systems in that sub-units within the system are purposeful and can select both the goals and the means to achieve them.

<sup>iv</sup> Note a key difference here with the strategy implementation literature cited above: The assumption here is not that a given strategy requires a specific organizational form (e.g. that an innovation strategy necessarily requires a product based organization), but that there must be a link between strategic goals (higher level functions) and the mandates and goals of organizational units (lower level functions). In line with Gresov & Drazin (1997) it is further assumed that there may be multiple ways of satisfying a given set of functional requirements (i.e., equifinality). At the same time, this does not imply that any solution will be equally effective, and the two generic axioms described in this text – as well as client-specific criteria and constraints - can be used to evaluate alternative structural options (i.e., sets of design parameters) against each other.

<sup>v</sup> Due to limited space I ignore the final step of the design process: How design parameters are realized. This is normally done by allocating resources (human and financial) to design parameters. In AD this is captured by the concept of Process Variables (PVs), which may be called Resource Variables (RV) when AD is applied in organizational settings.

<sup>vi</sup> The initial challenge is often to think in more outcome-oriented ways to properly separate function from structure. Functional requirements should be solution-neutral (i.e., they should not indicate how the function is to be fulfilled (Suh, 1990, 2001). It is helpful to formulate functional requirements using verbs (“Ensure compliance with laws and regulations”) and design parameters using nouns (“Corporate staff”).

<sup>vii</sup> One may compare this definition to other definitions of organization design. The emphasis in some parts of the organization design literature has been on identifying the optimal coordination mechanisms between already existing elements (units or roles) (e.g., Galbraith, 1973). In contrast, the emphasis in the AD approach is how one can verify that one has the right elements to begin with and ensure the right allocation of goals (functions) across elements (design parameters).

<sup>viii</sup> According to AD, coupling is always negative: Suh (personal communication, January, 2014) reasoned that one should always try to avoid non-independent FRs as they may negatively interfere with each other in the future, even if they are positively related at the time when one is developing the design.

<sup>ix</sup> It is indicated that coupling related to FR<sub>15</sub> (“Manage risk, secure funding, and allocate capital) would remain at this level of analysis. It was assumed that the units responsible for product development and management would still be responsible for risk management in the future.

<sup>x</sup> The risk management process will depend on the type of product and work processes. A sales unit (e.g., a branch of the bank) may be authorized to make loans such as mortgages within certain limits. Still, the product unit in a scenario such as the one described in the text would still be the one providing the capital and thus be responsible for monitoring the overall risk exposure.

*Table 1a.* Example of a design matrix where some of FRs are interdependent (i.e., coupled). A capital “X” indicates a strong relationship between a FR and DP, while a lower case “x” indicates a weak to moderate relationship.

<i>Functional requirements</i>	<i>Design Parameters</i>			
	Product unit A	Product unit B	Sales unit 1	Sales unit 2
Maximise profitability for product A	X	x	x	x
Maximise profitability for product B	x	X	x	x
Maximize revenues in region A	x	x	X	
Maximize revenues in region B	x	x		X

*Table 1b.* Example of an uncoupled design matrix where FRs are independent. A capital “X” indicates a strong relationship between a FR and DP, while a lower case “x” indicates a weak to moderate relationship.

<i>Functional requirements</i>	<i>Design Parameters</i>			
	Product unit 1	Product unit 2	Sales unit 1	Sales unit 2
Maximise quality of product A	X			
Maximise quality of product B		X		
Maximize revenues in region A			X	
Maximize revenues in region B				X



Table 2. Excerpt from the interview guide used in the project.

<i>AD term</i>	Questions
Functional requirements	<ul style="list-style-type: none"><li>• Could you explain the main role or mandate of your unit?</li><li>• Given this mandate, can you give examples of 3-4 key goals or KPIs that you are measured on?</li></ul>
Design parameters	<ul style="list-style-type: none"><li>• What are the key sub-units/ departments within your business area/unit?</li><li>• What are the key decision bodies and governance processes in your business area/unit?</li></ul>
Coupling	<ul style="list-style-type: none"><li>• Are you able to maximise the performance (according the goals or KPIs mentioned) without simultaneously negatively impacting the performance of other units in the Group? Or vice versa, are other units able to maximizing their performance without negatively impact your performance?</li></ul>

Table 3. Mapping of FRs against DPs for financial services group. A capital X signifies a strong relationship, while a lower case x signifies a moderate to weak relationship between an FR and a DP. The numbers in the squares refer to the observations described in the text.

<i>Functional requirements</i>	<i>Design Parameters</i>		
	Business areas	Support units	Staff units
FR <sub>11</sub> Sell financial products and services	5 X		4 x
FR <sub>12</sub> Develop financial services and products	X	X	x
FR <sub>13</sub> Provide support and delivery capacity (branches, online bank)	1 x	X	3 x
FR <sub>14</sub> Manage risk, secure funding, and allocate capital	x	2 x	X
FR <sub>15</sub> Ensure compliance to guidelines, policies		x	X

Table 4. Proposed decoupled design matrix for financial group.

<i>Functional requirements</i>	<i>Design Parameters</i>			
	Sales units	Product units	Support units	Staff units
FR <sub>11</sub> Sell financial products and services	<b>X</b>			
FR <sub>12</sub> Develop financial services and products		<b>X</b>		
FR <sub>13</sub> Provide support and delivery capacity (branches, online bank)			<b>X</b>	
FR <sub>14</sub> Manage risk, secure funding, and allocate capital		x		<b>X</b>
FR <sub>15</sub> Ensure compliance to guidelines, policies				<b>X</b>