Chapter 10
Business, Organizational and Information Processes

Abstract This chapter offers a method to carry out variety engineering throughout an organization. Is the current design of implementation activities effective? Does the structural distribution of regulatory functions offer a good strategy to manage the complexity implied by the organization's purposes? The method first offers a diagnosis of the current complexity management strategies and then helps to design better strategies. This chapter illustrates the alignment of *business processes* with *organizational* and *information processes*. It uses the Viplan Method and the Soft Systems Methodology to study information processes. The argument evolves a particular business process in an enterprise. This process provides the platform to work out information requirements and structural alignments. It explains in some detail the alignment of information, business and organizational processes.

This chapter elaborates in further detail resources and discretion centralization and decentralization with a focus on variety engineering. We have said that an organization emerges when the recurrent interactions of a group of people *create, regulate* and *produce* collective meanings. However, for effective performance a balance should be achieved between actions *producing* the intended collective purposes and actions *enabling* this production. In the extreme, if all actions went into production there would be neither capacity to support connectivity and cohesion nor capacity to adapt to a changing environment. We have called the actions producing the products implied by collective purposes *primary activities,* and those enabling them *regulatory/support activities*. Viable systems emerge from the connectivity (i.e., communications and interactions) among its primary and regulatory/support activities. A purpose of this chapter is offering a method to engineer the variety of implementation and development processes with the support of information and communication processes. This method should also help with studying the configuration of resources with the idea of developing the organization's capabilities.

Key distinctions we make in this chapter are those of business, organizational and informational processes. Under the generic name of *business processes* we include *implementation and development processes,* which are different to the already discussed cohesion and adaptation organizational processes (see Chap. 6). Business processes are completely focused on 'activities' regardless of their

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organizational embodiment; these activities may be subcontracted to third parties or performed by other primary activities within the same organization, on the other hand organizational processes are completely embodied in the organizational system (cf. the cohesion and adaptation mechanisms of the VSM). The connectivity of resources, whether internal or external to the organizational system, requires *information processes* that are enabled by information and communication technologies (ICTs). We understand implementation processes as a set of interrelated activities producing the products or services that the organization delivers to its customers. On the other hand a set of interrelated activities such as marketing, finance and research and development aiming at creating a viable new product is an instance of a development process. This chapter gives methodological support to explore the interdependence of business, organizational and information processes. To make simpler our presentation we will focus on implementation processes, which often are related to the supply chain producing the organization's products and services (Porter 1985).

The idea of primary activities suggest that beyond managing the value chain, those producing products and services at the local level need to have flexibility to define their own policies. This hugely amplifies local variety to respond to local needs and avoids the imposition of hierarchical, insensitive, global policies. On the other hand, distributing the activities of an implementation process at different structural levels, beyond the flexible response of autonomous local teams, increases the chances of reducing them to post boxes distributing to other groups the responsibilities to deal with customers' requirements. As they do this, local teams lose contact with the very people that they are supposed to service.

There is no doubt that structurally, it is desirable to have relatively small teams responsible for the value chain of an implementation process in an organization; they can operate from inputs to outputs through a transformation process that is theirs. These teams absorb most of the customers' variety locally; customers can see the 'faces' of those responsible for the products and services they consume. For instance citizens in need of housing services would be able to interact with the unit responsible for assessing their needs as well as for delivering the services. This avoids fragmenting service delivery; proximity allows for the right hand to know what the left is doing. However, the increasing complexity of people's demands, the extraordinary pace of technological developments as well as the constraints imposed by culture and resources tend to force some degree of centralization as organizations look for synergies and economies of scale.

Most significantly, local teams may benefit from global information to effectively close local loops. Among others, policy priorities may be decided globally, specialised knowledge and resources may be pooled together beyond local teams and the economies of scale offered by available technologies may tempt centralization. But, centralization increases the chances of functionalism at the expense of holism. Implementation teams risk becoming customer service units with limited appreciation of, and responsibility for, the total service they offer (Seddon 2008).

In this effort for holism the cost of communications is changing the balance between centralization and decentralization. Today's decreasing cost of

communications makes possible creating virtual teams that facilitate decentralization (see Chap. 8). Members of centralized groups with specialised knowledge can be effective contributors for the creation and implementation of local policies. People responsible for the use of expensive centralized resources can be made (virtually) part of local teams and thus accountable to the team. These are cases of resource centralization and functional decentralization (see Chaps. 9 and 12). Equally, those working in these groups, with local knowledge of stakeholders in general and customers in particular, can influence more effectively global policies by communicating to policy-makers local responses to existing policies.

From the perspective of organizational design the challenge is fostering a cascading of self-contained product and service teams which make possible the progressive integration of functions into larger self-contained groups that match customers' needs at different performance requirements. For instance, for housing services, local teams focused on providing particular types of services can be embedded in regional units with functional capacity for the deployment of building and maintenance resources according to local needs. What is particular to this proposition is that building and maintenance resources provide a more global performance requirement, namely building and maintenance capabilities, at the same time that they are contributors and accountable to local teams for local services. *As the cost of communications is reduced the allocation of resources can be reconfigured transforming the organization's capabilities.* Constituting effective local teams and coordinating these multiple teams in a global context becomes increasingly challenging but also, with the support of new information and communication technologies, manageable and potentially more effective.

Performing a complex implementation process, such as air transportation, at its most detailed level may require hundreds or even thousands of interrelated activities. Structurally, we would like that implementation processes correspond to primary activities all the way to the last level of the unfolding of complexity. However, this proposition needs some qualifications that we clarify in this chapter. Our purpose in modelling implementation processes is improving the organization's management of its complexity; this requires variety engineering. It makes sense that those activities that are highly interconnected are managed together in one organizational unit (see Chaps. 5 and 8). In simple terms, if highly interrelated implementation activities correspond to different primary activities their coordination becomes more difficult, as a consequence of perhaps a badly organised workflow. Equally we would expect that the chunking of the organization's transformation be done in chunks of similar complexity. In general it makes no sense to manage at the same structural level high and low complexity primary activities. A principle of variety engineering, as clarified in Chap. 8, tells us that interrelated implementation activities should belong to one primary activity rather than being distributed among two or more. As the structural recursion of an implementation process is increased the same principle applies. This implies that for as long as practically possible implementation processes should be contained within nested primary activities all the way to the lowest structural level. However, whenever the workflow requires the contribution of activities not embedded in the

primary activity owner of the implementation process the organization should be prepared to increase regulatory resources to maintain an effective flow of activities. This is indeed the idea of a cohesive organization.

However, to proceed systematically with the argument we will assume that all the activities of each of the implementation processes correspond with a primary activity from the global to the most local structural level. At the end of the chapter we will discuss how to remove this restriction and accept that activities such as procurement, dispatching and so forth, at the same time of constituting local implementation processes, may be resources at the discretion of more global primary activities.[1] Therefore from the perspective of distribution of resources we are talking about functional decentralization and resource centralization.

Is the current design of implementation effective? Does the structural distribution of regulatory/support functions offer a good strategy to manage the complexity implied by the organization's purposes? This extension of the Viplan Method starts from a diagnosis of the current complexity management strategies and then helps to design better strategies. It illustrates the *alignment of business, organizational and information processes* with the support of Brian Wilson's application of Soft Systems Methodology (Checkland 1981) to information processes (Wilson 1984). We start with the illustration of implementation processes in an enterprise. These processes provide the platform to work out regulatory and information requirements for their management.

Let's take for instance the airline company of Chap. 8. Figure 10.1 shows its unfolding of complexity. We recognise five implementation processes in which the company is involved: passenger transportation, mail and cargo service, chartering planes, renting planes to other companies and offering maintenance services to other airline companies. These five implementation (business) processes are marked in the figure at the bottom of the unfolding of complexity.

Notice that Satena encapsulates these business processes in higher levels of recursion according to the regional segmentation of its activities. In general, implementation processes are *vertically integrated* according to structural complexity drivers such as geography, time and market segmentation (see Chap. 8). Implementation processes show, in addition to the chunks of complexity necessary to produce a transformation, the other activities necessary to get supplies and deliver products and services. Figure 10.2, for instance, shows Satena's aggregated implementation business processes.

Information is necessary to carry out implementation processes. To sell an airplane ticket we need information from the client but also information about flight schedules. We also need price information, seats available, hotel reservations, car rentals and so on in order to meet clients' expectations. Of course we also need to process information internally for accounting, financial and monitoring purposes.

[1]Implementation activities can also be subcontracted to external organizations but we will not consider this case here to simplify the argument.

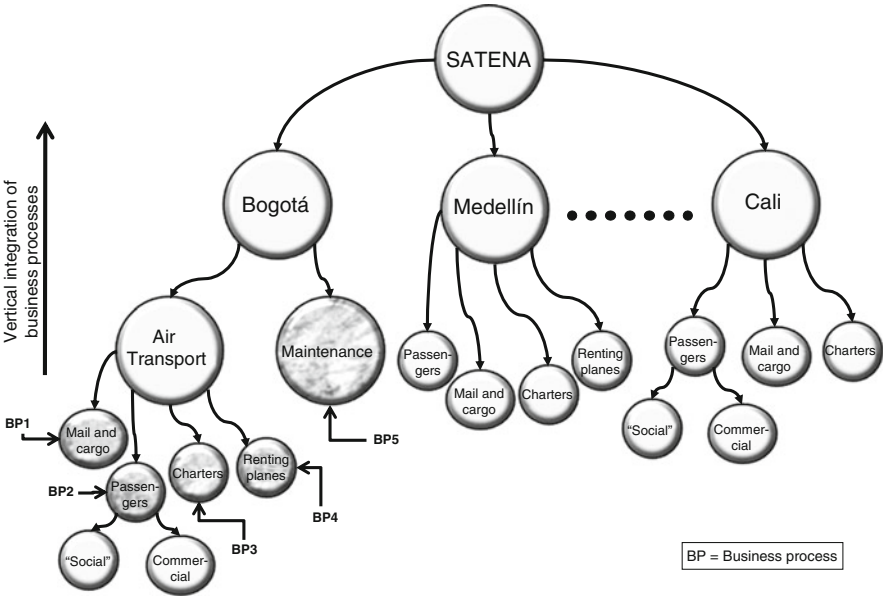

Fig. 10.1 Satena's business processes

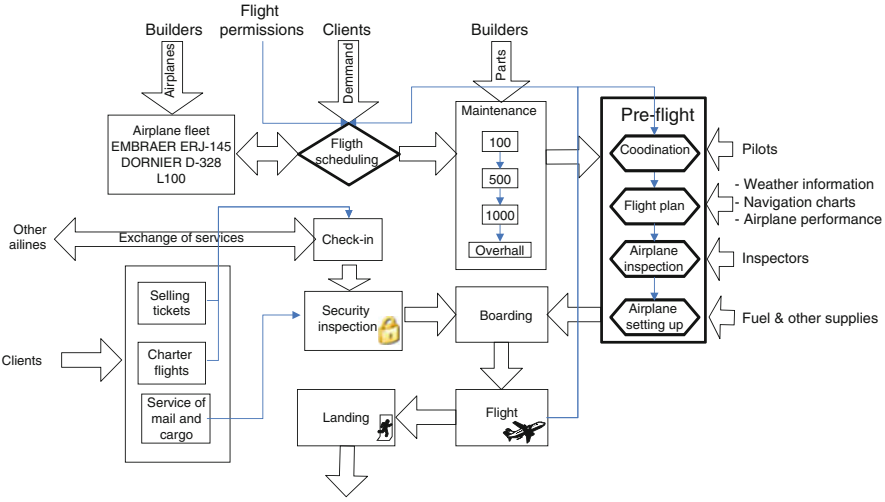

Fig. 10.2 Satena's simplified implementation business processes

But before going any further in showing the structural relation between implementation and information processes, let us define the latter with more rigour.

Bateson (1972) defined information as the difference that makes a difference. In this definition he was implicitly making a distinction between data and information;

information is data with a purpose. Because different people may ascribe different purposes to the same situation, the same data may be construed as different information by different people. For instance, the working hours per month related to a person in a company are data. Data become information when someone uses them to calculate the payroll of the company. But these data become a different piece of information when used to estimate a budget for a proposal that the company is preparing.

Different organizational roles may give different meanings to the same data. Each role uses information to perform its activities and to relate to other roles. Usually this information is encapsulated by grouping data in order to make apparent its implicit purpose. For instance information about a *client* for Satena may include personal data (identification number, name) and data about his or her residence location (city, address, phone number). In the same sense, the company may need information about their planes to account for their performance. So they may construe particular *information-categories* by grouping data as shown in Fig. 10.3. Here we can see data models for two information-categories: *Clients* for Satena and flight *statistics*.

Now we can define an *information processing procedure* (IPP) as a set of activities that transform data into information categories used by an organization. It is clear that these IPPs can be as simple as the examples in Fig. 10.3 or as complex as interpersonal information management procedures. The former are associated with components of information systems and the latter with communication systems. With these definitions in mind, let's go back to show some structural relations between implementation and information processes.

In our restricted model we have agreed that an implementation process is carried out by a primary activity and is enabled by some of its regulatory/support activities. The mission of Satena, for instance, is offering services to its clients: transporting passengers, mail and cargo, renting planes and maintenance services to other companies. The company organizes its transformations enabling several recursion levels (Fig. 10.1). Each recursion level, as explained in the previous chapter, has a different functional capacity depending on the distribution of resources and discretion that the company has agreed upon (see table recursion/functions in Fig. 10.4).

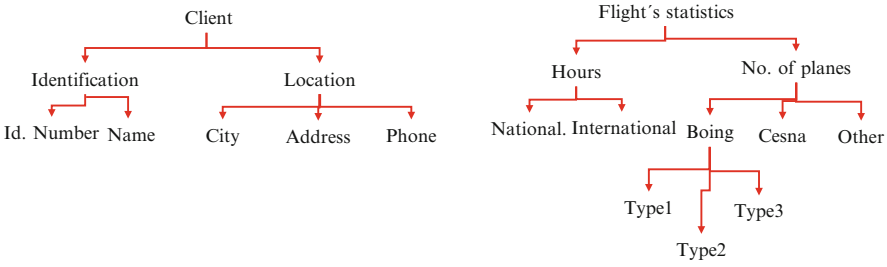

Fig. 10.3 Data models of two information-categories for an airplane company

Regulatory functions / Primary activities	Human resource managt	Budget	Training	Fees setting	Bookings	Sales	Marketing and advertising	General services	Acquisitions	Operations control	Internal control	Planning & systems	Security
Satena	•	•	•	•	•	•	•	•	•	•	•	•	•
Bogotá		•				•	•	•		•	•		•
Air transport							•				•		
Passenger transportation						•	•				•		
Commercial routes											•		
"Social" routes											•		
Mail and cargo						•					•		
Charters						•	•				•		
Renting planes						•					•		
Maintenance											•		
Medellín		•				•	•	•		•	•		•

Fig. 10.4 Distribution of discretion for Satena

Remember that each dot in this table delimits the scope to perform that particular regulatory function in a particular level of recursion. This can be established by using one or more verbs to describe this function as we showed in Fig. 9.8 (previous chapter). Regarding the sales function, at the corporate level they *consolidate* national sales whereas in the office located in Bogotá they *coordinate* sales in the city. On the other hand, in the primary activity called passenger transportation, they actually *sell* the tickets and so on (Fig. 10.4).

Having said this, it should be clear that in order to perform the transformation of each primary activity the information necessary to carry out each of the regulatory functions at each level must be available. Remember that each dot in the table represents the level of responsibility for carrying out a particular function (a column) in a given primary activity (a row). This level of responsibility can be expressed by one or more specific verbs. In order to perform these tasks in a proper way, people in the organization need updated information that should also be aggregated at the right level. This level of aggregation, again, can be derived from the levels of recursion at which a particular function has been distributed in the recursion/function table.

If a local manager, for instance, has discretion to define and execute the publicity campaign for local products, it makes sense for him or her to have updated and detailed information about product sales over time. It will be of little use to have

only aggregated sales numbers. On the other hand, to give regularly too detailed information of particular local products to the company's sales managers will easily overload them and take them away from the sales managing loop of the global company.

In other words, we need information processing procedures and information-categories that provide the necessary information to each regulatory function at each particular level of recursion. This information should be coherent with the verbs describing the corresponding function it supports. In the case of Satena, at the corporate level we need information regarding the aggregation of sales at the national level; in Bogotá we need access to information regarding sales in the city; and in the unit in charge of passenger transportation, we need information to close the sale of a ticket.

Information processing procedures allow the connection between regulatory functions and primary activities and, in doing these links they support the execution of the company's implementation processes. From the point of view of design, notice that once we have built a recursion/function table (such as Fig. 10.4) for a particular organization, it can be used to specify the information systems needed to define the information provisions across the organization's structure. This is the reason we refer to the recursion/functions table as the organization's conceptual information system.

We have examined so far the close relation among primary activities, implementation processes and regulatory functions. We also have illustrated how information processing procedures (via information systems) are important for establishing and maintaining this relation. We would like to develop now, with more precision, the notion of organizational processes and its relation to information processing procedures.

In general terms, as explained in Chap. 6, organizational processes are constituted by the mechanisms for adaptation and cohesion. Figure 10.5 shows the mechanism for adaptation. Once a relevant issue for the adaptation of the organization is selected, the debates between the people concerned with the 'outside and then' (intelligence function) and the people concerned with the 'inside and now' (cohesion function) should be enabled and monitored. For policies to be effective we need IPPs supporting this mechanism in at least four ways, as shown in Fig. 10.5.

In the first place the people constituting the intelligence function need to be in permanent interaction with agents in the organization's problematic environment. Gathering relevant information is vital in order to define new products and services, find new markets, learn about the competition, find new suppliers, learn about new regulations that may affect the organization and so forth. We need IPPs that permanently support these activities (IPP1 in Fig. 10.5). Nowadays there are several information systems available to fit this purpose such us: innovation trend analysis (Vibert 2000), patent busting, technology scanning,[2] business intelligence (Turban et al. 2010) and scientometric analysis (Vinkler 2009).

[2]See for instance: http://www.pathnet.org/sp.asp?id=15636

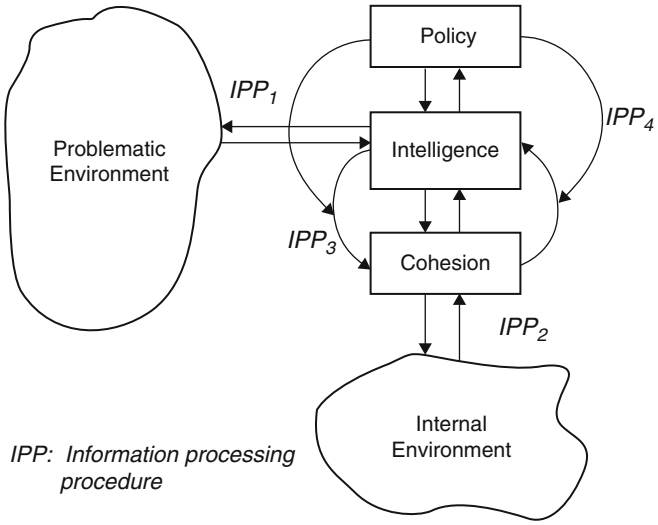

Fig. 10.5 Information processing procedures supporting the mechanism for adaptation

On the other hand, people related to the cohesion mechanism should develop a deep understanding of the 'inside and now'. Multiple IPPs support the cohesion function. For instance, knowledge management systems that enable organizational learning are part of information processes at this level (IPP2) (Espejo et al. 1996). These IPPs, considering our attention to implementation (business) processes are the focus of our discussions below.

The adaptation mechanism requires that people in intelligence and cohesion are highly interconnected (see Chap. 6). Information and communication processes can be set in order to support this relationship (IPP3). Microsites developed in the internal web and the use of virtual communication technology such as videoconference and video-presence are only a few examples at this level. In addition to these there are other technologies that offer a good way to orchestrate the relation between intelligence and cohesion. Stafford Beer's Syntegration is a very good example (Beer 1994).

Finally, people related to the policy function need to be aware of the quality of relations between intelligence and cohesion. In the early development of the VSM this kind of technology was associated with Project Cybersyn's 'operations room' (Beer 1975, 1981). More recently similar environments, based on more advanced technologies, support this task (Holtham et al. 2003).

In a similar way an organization needs to develop IPPs to support the effective operation of the cohesion mechanism. Figure 10.6 shows this generic mechanism for all regulatory functions that are the discretion of the organization in focus (see Chap. 9).

From the discussion of the cohesion mechanism in the previous chapter, it should be clear that information technology enables its operation. Among other

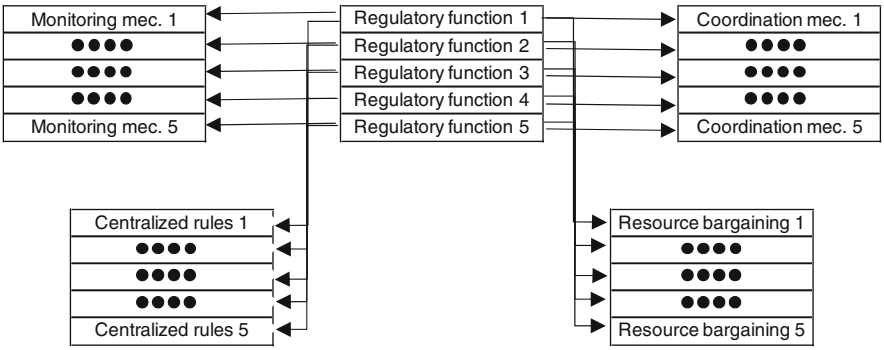

Fig. 10.6 A generic cohesion mechanism

IPPs, auditing systems and ICTs support monitoring; workflow and internal communication systems such as bulletin boards, intranets, micro-sites and similar systems support coordination; budgeting systems support resource bargaining and internal communication systems support issuing centralized rules.

To summarize: organizational processes constitute the two mechanisms for viability – adaptation and cohesion. We have illustrated IPPs and ICTs enabling their operation. This discussion provides a structural context for the development and use of these technologies.

Now we are ready to explore more in depth the relations between implementation, organizational and informational processes; this exploration at this stage is simplified by our initial assumption that an implementation process is fully contained by a primary activity. Here the tool we will use to connect primary activities, IPPs and information categories is an adaptation of Wilson's Maltese Cross (Wilson 1984).

Figure 10.7 shows the general structure of our Maltese Cross. In the central column, at the top (N or North axis), we have all primary activities of the organization according to its unfolding of complexity. In the same column, but at the bottom (S or South axis), we have all the IPPs used by the organization. The main row (W or West axis and E or East axis), on the other hand, contains the information-categories that underpin the information flows along the organization. Before explaining the use of this tool, let us see how it is completed.

Every primary activity can be modelled, by a transformation process of inputs into goods or services (see Fig. 7.7). Information is necessary in order to carry out this transformation. For instance, as mentioned before, to sell a flight ticket the company needs information about the client, flight schedules, prices, number of passengers per plane and so on. As a result of the transformation, this information is modified. In the previous example, after selling a ticket the information about the number of passengers in the plane is changed and also we have to update information regarding sales, statistics and so on. In other words, any transformation process of a primary activity has associated multiple IPPs.

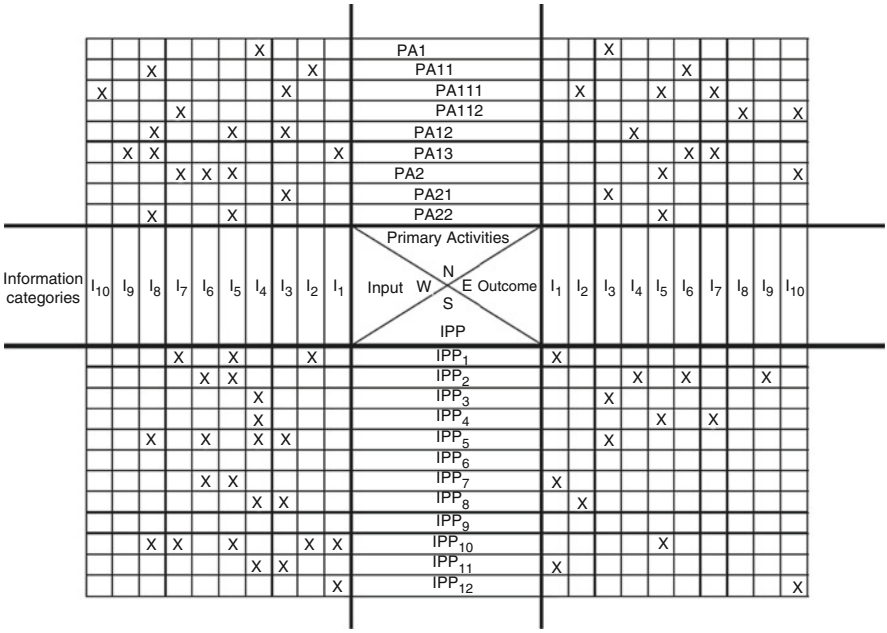

Fig. 10.7 The Maltese Cross

Having said this, a close examination of the transformation processes of all primary activities allows the construction of the relevant information-categories for the organization's implementation business processes (see as an example, Fig. 10.3). These information-categories form the main row of the Maltese Cross. Notice that the East axis is mirrored in West axis of the main row.

To fill in the north part of the Maltese Cross, we take primary activities one by one and select all the information-categories needed to carry out their transformations. We mark this relation with an X in the north-west part of the Cross. Then we find out what information-categories are modified as a result of the transformation. We mark them with an X in the north-east part of the Cross. By doing this for each primary activity we fill in the Xs of the North part of the Maltese Cross.

In order to fill the south part of the Maltese Cross, we need to identify IPPs in the organization. They are often computer based and manual information systems; however, they can also be communication IPPs, such as meetings and operational setups. They form the bottom part of the main column of the Cross. By examining which information-categories are used as an input for each IPP and which ones are modified, we fill out the south part of the Cross.

Having explained how the Maltese Cross is constructed, let us see how it can be used as a variety engineering tool to align implementation, organizational and information processes in an organization.

Organizations are continually improving their information procedures in response to technological developments and new stakeholders' expectations.

Usually this continuous process is neither carried out by the same personnel nor uses the same methodological approaches. So, with time, there is a vertiginous expansion of IPPs which may not be aligned with previous developments or with the adjustments of implementation processes. The Maltese Cross is a useful tool to observe these problems. Here we will show four of them in order to illustrate its potential use.

If we look at the south-west quadrant of the Cross in Fig. 10.7, we can see that every column has more than one X. This means that each information-category is used as an input by more than one IPP. Take for instance the information-category I3 in this figure. It is needed in order to carry out three IPPs [IPP5, IPP8, IPP11]. If these information-categories are not part of a single database, there is a risk of managing inconsistent information. In other words, this analysis may be useful to define a strategy to integrate databases.

In a similar way, if we look at the south-east quadrant and find columns with several Xs, we may have a case of unnecessary redundancy in IPPs. In Fig. 10.7, for instance, the information-category I3 has two Xs which means that it is the outcome of IPP3 and IPP5. Now, if we see which information-categories are inputs for these IPPs, we find that all inputs for IPP3 are also inputs for IPP5. In other words, we have two IPPs that modify the same information-category and the input of one is a subset of the other. This is precisely the case of an unnecessary redundancy we mentioned above. In other words, probably with a few adjustments in IPP5 we can eliminate IPP3 without losing any functional capacity.

If we examine now the south-east quadrant and look for a column that does not have Xs, it indicates an information-category that is not produced as an outcome of the operation of any of the existing IPPs. This is the case of I8 in Fig. 10.7. However, as we can see in the same figure, I8 is one of the inputs needed for several primary activities (PA11, PA12, PA13 and PA22). This suggests the importance to incorporate the generation of I8 as part of any of the existent IPPs or to build up a new IPP to take care of its production. In any case, this particular analysis can be used as a guide to improve the scope of actual IPPs in the organization.

Finally, if we look at the columns in the quadrant north-east and find an information-category with several Xs, that means that this information is the outcome of various primary activities. This is the case of I3 in Fig. 10.7. But looking at the quadrant south-east, we can see that I3 is produced by two IPPs (IPP2 and IPP5). This implies that the primary activities that modify I3 should coordinate themselves in the use of either IPP2 or IPP5 in order to avoid managing inconsistent information.

The above discussion illustrates four ways of using the Maltese Cross as a diagnostic tool in order to keep a certain degree of cohesion among business processes and information processing procedures in an organization.

So far we have introduced a tool to relate primary activities, which we have assumed match implementation processes, to information processing procedures. However, it should be apparent that Fig. 10.7 is a short hand for the full information system of an organization. The south axis, unless we restrict its scope, includes all of

the organization's information processing procedures since the north axis includes all the organization's primary activities. For the same reason the west-east axis would include all imaginable information categories. This would be an extremely high variety, unmanageable, Maltese Cross. The challenge is restricting this variety to make this tool useful. An alignment of organization and information processes suggests two major types of information systems, namely, cohesion and adaptation information systems. The cohesion information system, as implied earlier in this chapter (see Fig. 10.6), is constituted by the resources bargaining and coordination information systems. The resources bargaining information system is restricted to working out Critical Success Factors, essential variables and performance indices for each of the organization's primary activities (Espejo 1992; Reyes 2007). This was the variety engineering of the Cyberstride information system designed by Stafford Beer for the Chilean economy in the early 1970s. Our discussion of the IPPs shown in Fig. 10.5 related this information system to the other communication and information systems of Project Cybersyn as developed in Chile (Beer 1981; Espejo 1980, 2009). But perhaps from the perspective of variety engineering the most challenging information processing procedures are those supporting the coordination of process activities, such as implementation. These IPPs are discussed below.

Summarizing, so far we have matched primary activities' transformations and implementation processes at different levels of recursion. In a primary activity, implementation processes transform inputs into higher value outputs and for this, in addition to the transformations of its embedded primary activities, it requires *support functions* such as procurement, distribution, transportation and many other logistic activities, and also it requires *regulatory functions* such as finance, marketing and personnel to manage them. The challenge is grouping these support/regulatory functions together in the necessary organizational processes for the primary activity's viability and the viability of the total organizational system. Information processing procedures allow the necessary information flows to connect primary and support/regulatory activities. So far we have shown how the unfolding of complexity, the recursion/function table and the Maltese Cross can be used to relate implementation, organizational and information processes in an idealized situation (see Fig. 10.8). We now want to remove this restriction.

An important assumption of all the above discussion was that primary activities matched implementation processes, or, in other words, that their complexities are contained within individual primary activities, however, a common situation is that activities constituting the implementation process not only are the discretion of other primary activities as is the case of centralized functions supporting several business processes, but are sub-contracted elsewhere. We need additional methodological support to deal with implementation processes that are not contained in one primary activity, as is, for example, the procurement of raw materials and the dispatch of products when they are centralized beyond this primary activity to support several of them.

The following extension of the method presented so far removes the restriction we imposed at the beginning of implementation processes mapping one-to-one primary activities. It uses the Maltese Cross and the recursion/function table to

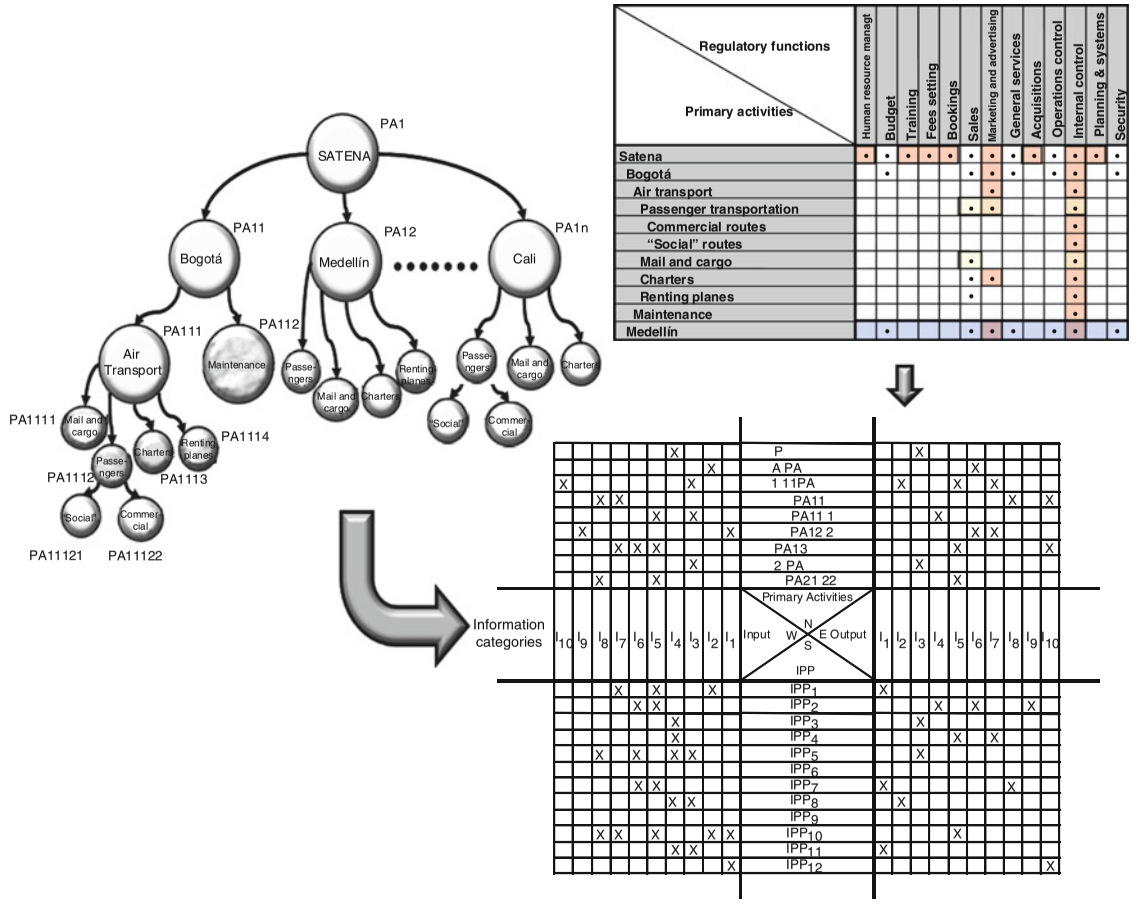

Fig. 10.8 The use of unfolding of complexity, the recursion/functions table and the Maltese Cross to align business, organizational and information processes

discuss the effective interrelation of implementation processes, organizational processes and information processes. We will discuss this methodological extension for one business process; however, the recursiveness of the VSM implies that the same method applies to all business processes.

The methodological tools used in this extension are interdependent and their application is not linear. This is a reflection of the fact that implementation, information and organization processes are co-evolving together in loops of mutual influence. Our focus is on one implementation process – Information-acquisition of a simulated enterprise: COMLIS,[3] and the aim is showing the interdependence of all these processes and their use to work out alternative structures for implementation processes. For instance, the use of this tool may make apparent that a centralized resource can be effectively integrated as an activity of an implementation process at a lower structural level. The general method is as follows:

1. *Naming the organization-in-focus*. The general tool is naming systems (see Chap. 7). The following is the name for COMLIS:

> A commercial provider of business and technical information, transmitted by any media or source to the subscribing organizations, in order to satisfy their information needs in a timely, efficient and cost-effective way

   The corresponding TASCOI for this name is the following:

   T = available information in the market into information provided
   A = people working for COMLIS
   S = publishers, information services, other libraries
   C = subscribing organizations
   O = COMLIS corporate management
   I = shareholders, competitors, professional bodies, regulatory bodies

2. *Structural underpinning of COMLIS*. Figure 10.9 shows a technological model of COMLIS and in Fig. 10.10 we see the unfolding of complexity.
3. *Naming an implementation process of interest*. Information-acquisition is an implementation (business) process for COMLIS closely related to *collection acquisition*, *information services* and *data capture*. The process was named as follows:

> Information-acquisition is a COMLIS business process to satisfy customers' information requirements with information available, inside and outside the enterprise, up to customers´ expectations of a reliable and timely service

4. *Producing a descriptive model of current implementation process*. The aim is to clarify its value chain, that is, the activities linking sources-suppliers-transformation-outputs-receivers. Figure 10.11 offers a simplified descriptive process mapping for information-acquisition.

[3]This case study was developed by Raul Espejo and Robert Gilmore of Syncho Ltd., to support consultancy and training programmes. Its purpose is communicating the method rather than showing its full-fledged and conceptually complete application to a 'real world situation'.

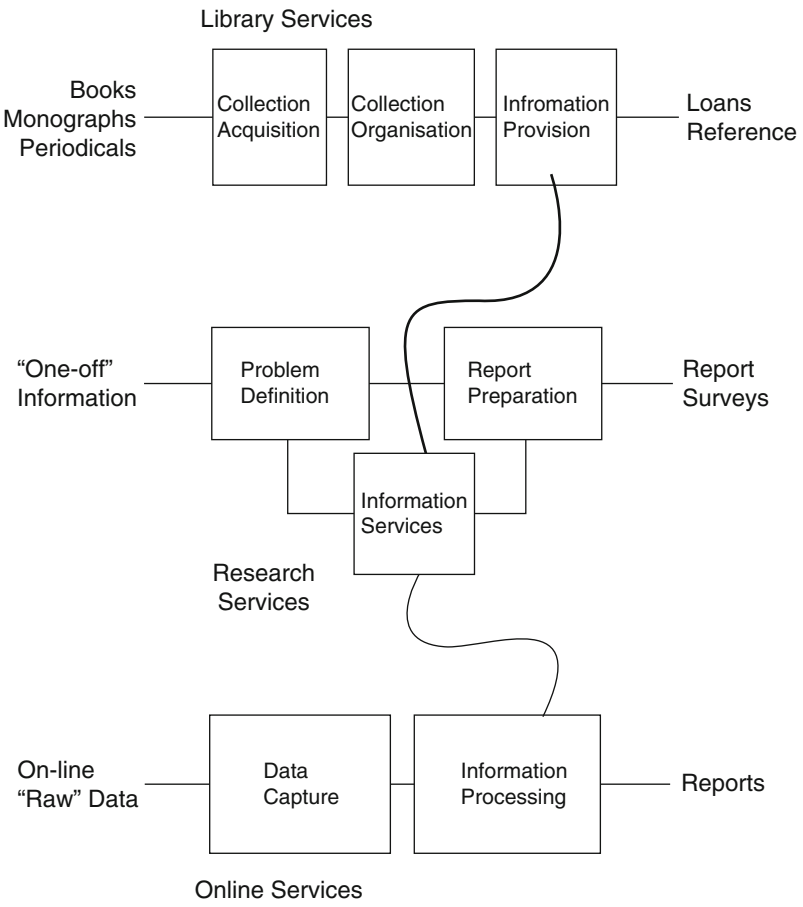

Fig. 10.9 A technological model for COMLIS

5. *Determining information requirements and provisions for the existing process.* Figure 10.12 is a Maltese Cross for information requirements and provisions.
6. *Working out the organization's recursion/function table*. Figure 10.13 shows a recursion/function table for COMLIS.
7. *Systemic purposes and recursion levels of the implementation (business) process activities.* The systemic purpose of some of the activities is producing products (implementation) and of others these purposes are resources bargaining and monitoring and coordination activities. Figure 10.14 is a Maltese Cross that links recursion levels, *business functions* as they are named in the company (e.g., systems support, assessment of information requirements, intelligence on sources and so forth), systemic functions (i.e., the systemic purposes of the business functions) and implementation business process activities.

   A first key aspect of this step is distinguishing the systemic purposes of the activities; is their purpose implementing or supporting/regulating the

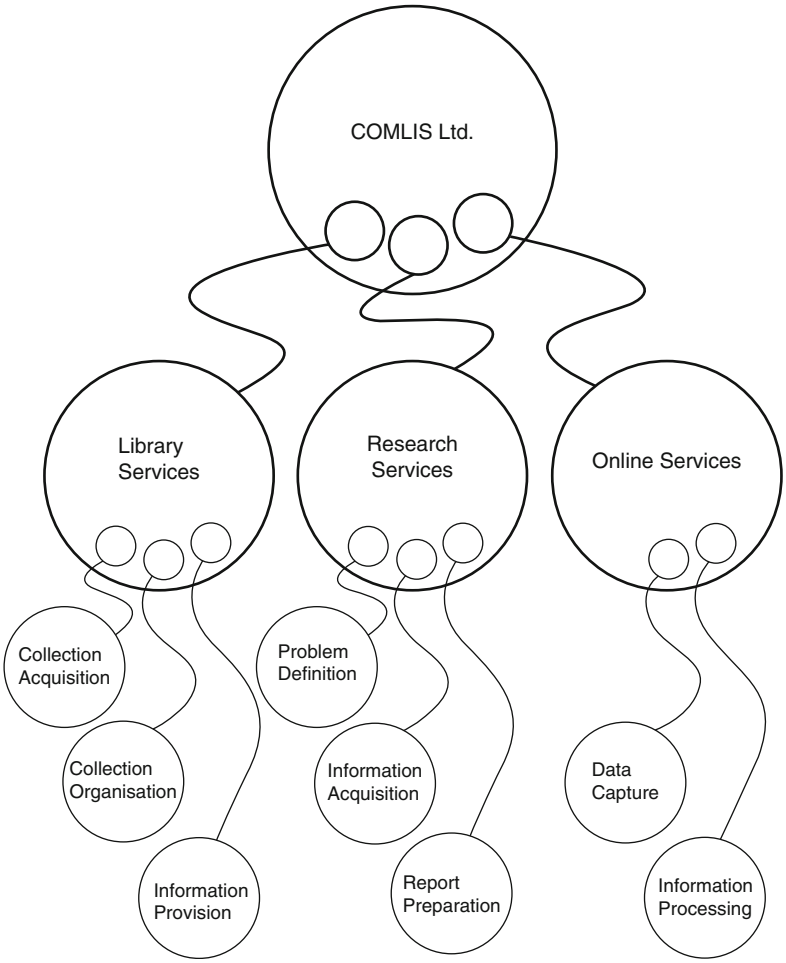

Fig. 10.10 Unfolding of complexity for COMLIS Ltd

transformation implied by the organization's purposes? If it is implementing they are parts of the organization's primary transformation; if it is anything else, they are regulatory/support components of the business process. This clarification helps mapping the business process activities onto the distinction primary activities and regulatory functions.

A second aspect is establishing the levels of recursion involved in this business process. If an organization has no recursion (i.e., does not have primary activities) and therefore has only one implementation business process, the situation is that described in the first part of this chapter. For the general situation of an organization with complexity unfolding, the recursion/function table separates implementation and regulatory activities at several

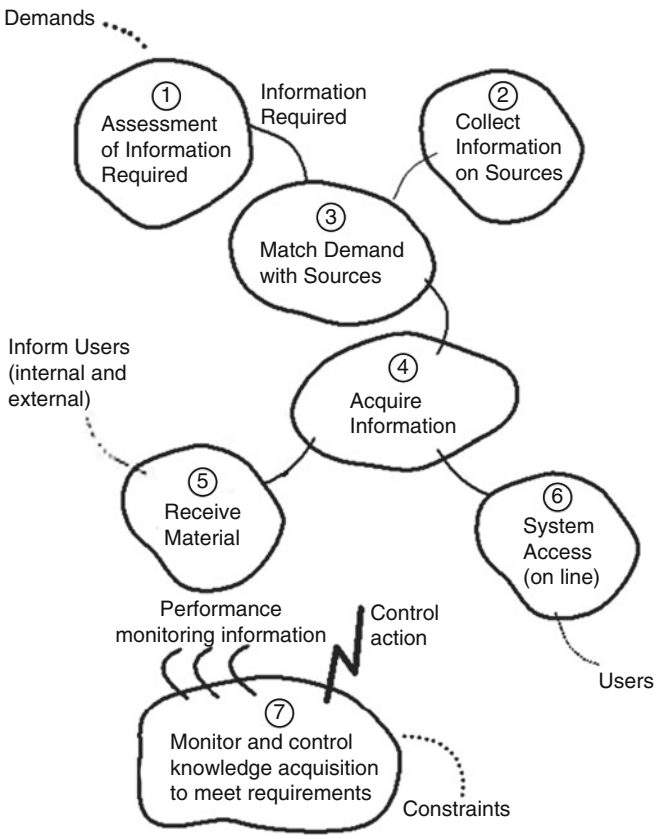

Fig. 10.11 A process model for information-acquisition

levels of recursion. Mapping the table of Fig. 10.13 onto the SE quadrant of Fig. 10.14 is the starting point of this step of the method.

The second is the mapping of business functions onto their systemic functions as is done in the SW quadrant of Fig. 10.14. Notice that in this case the implementation column is empty because all functions in column S are regulatory. The third is the mapping of business process activities onto systemic functions as can be seen in the NW quadrant. In the case of COMLIS Ltd, the first four are the implementation business process activities for Information-acquisition, whereas Receive Material, System Access and Control are regulatory/support activities for this business process. Finally, the NE quadrant of the Maltese Cross maps business process activities onto recursion levels.

The overall purpose of this step is descriptive; diagnosis and design are the concern of the next steps.

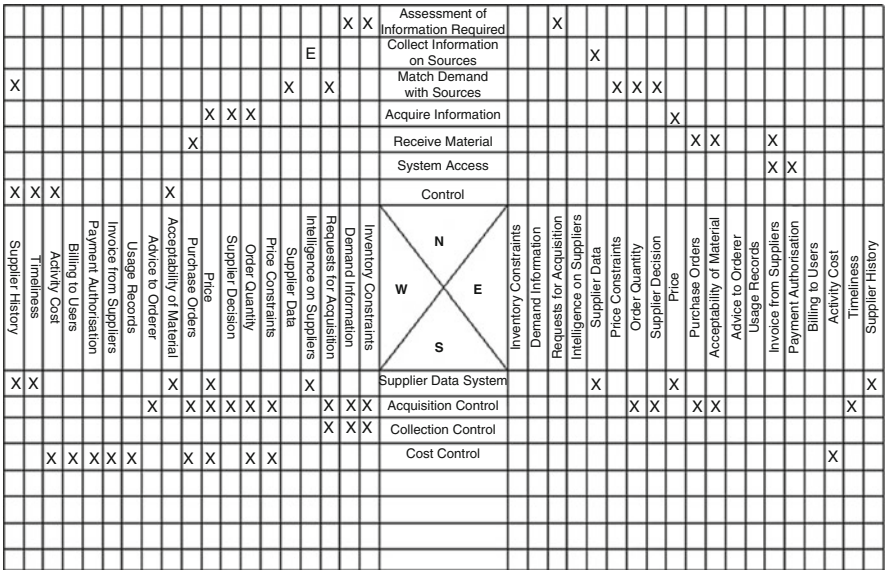

Fig. 10.12 A maltese cross for information-acquisition in COMLIS

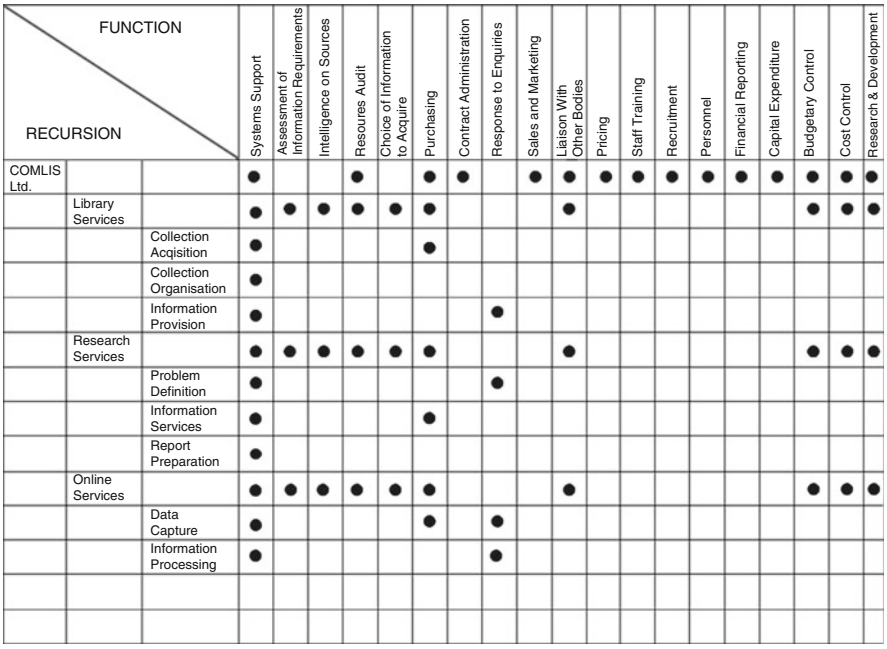

Fig. 10.13 Recursion/function table for COMLIS

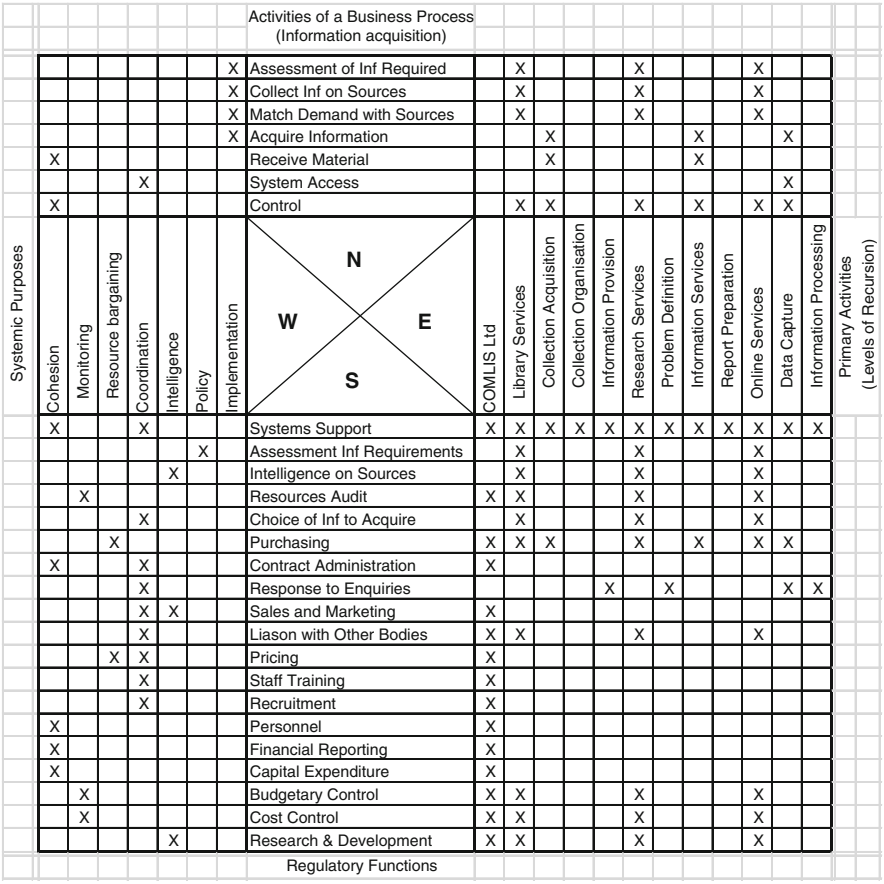

Fig. 10.14 Diagnosis of the alignment of business and organizational processes

Remember, the axes of this table contain the following:

N = business process activities
W = systemic purpose of regulatory functions (Cohesion; resources bargaining and monitoring; Coordination, Intelligence, Policy and Implementation)
S = organization's regulatory functions
E = organization's primary activities

Therefore each of the quadrants reflects the following relations:

SE = is the recursion/function table for COMLIS
SW = helps to clarify the systemic purpose of regulatory functions of COMLIS
NW = makes the distinction between primary and regulatory purposes for activities of the business process
NE = clarifies the recursion level at which business process activities take place

8. *Focus on implementation activities*. Clarifying which are the implementation business process activities allows us to work out a strategy to achieve the primary activity's transformation or, at the more global level, the organization's transformation. Some of the implementation activities may be right for the primary activity-in-focus, others may need reallocation to other primary activities, others may be sub-contracted with external suppliers and so forth. This clarification allows the focusing of the implementation business process activities on one recursion level. Does it make sense to keep a low complexity activity at the same level of high complexity activities, or is it better to embed it in one of the more complex process activities? The outcome of this step is a reallocation of the implementation activities of the business process.
9. *Focus on regulatory activities*. The information produced by the NE quadrant of step 7 allows us to study the cohesion mechanism relevant to the business process (cf. Fig. 10.6); it is now possible to detect gaps and possible communication problems in its regulation. This step brings together organizational and business processes and may imply either new regulatory activities to fill the gaps detected from the information provided by step 7 or reallocating discretion in the allocation of resources throughout the organization's recursive structure. Considering the available resources, technologies, in particular ICTs and best practices, is it better to centralize or decentralize the resources of a regulatory activity of the value chain?
10. *Designing total business process*. As outcomes of step 8 the implementation business process activities are aligned with the transformation of a primary activity and as an outcome of step 9, the regulatory business process activities are aligned with business functions and regulatory mechanisms at one or more recursion levels.

    The same Maltese Cross as described in Fig. 10.14 is now used in a design mode. Figure 10.15 shows this design mode; changes are shown in the cells marked in grey. The North axis shows the activities of the value chain in full, which include the necessary regulatory and implementation business process activities as emerging from steps 8 and 9.

    The West axis makes explicit the systemic purposes of these activities. The South axis shows the list of revised business functions; most likely this list will be very similar to the equivalent of Fig. 10.14, occasionally adding or subtracting one or more new business functions. In this case Purchasing has been renamed as Negotiation with Information Suppliers.

    The East axis is the list of recursion levels and the SE quadrant maps business functions onto recursive levels; this quadrant is the revised recursion/function table. In the NE quadrant we expect to see all the implementation business process activities aligned in single columns, producing the transformation of the respective primary activity, and the regulatory business process activities possible at several recursion levels (see Fig. 10.15).
11. *Aligning organizational processes with the designed business process*. This alignment depends on the distribution of discretion accepted for this business process in the organization as displayed in the NE quadrant of Fig. 10.15. Mapping regulatory activities of the designed business process onto the

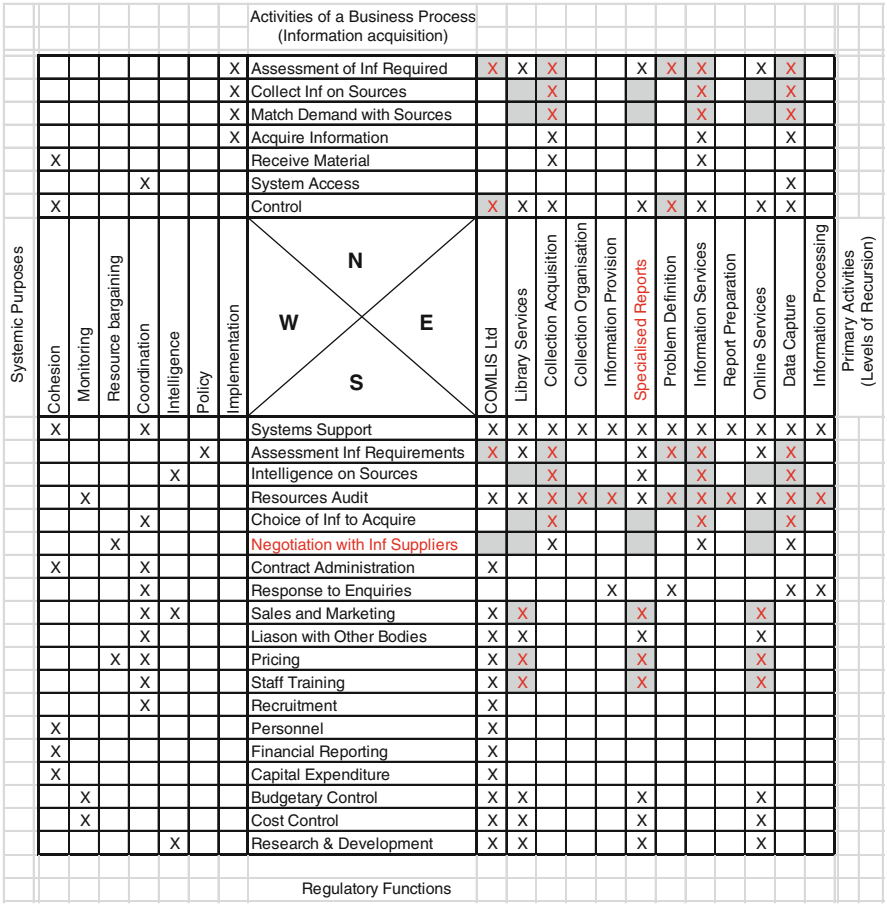

Fig. 10.15 Designing the alignment of business and organizational processes

recursion/function table helps to see the wider organizational implications of this design. For the primary activity-in-focus, relations of its business process regulatory activities with other regulatory functions is done considering their contribution to the wider organizational processes of which they are part, that is, the processes maintaining its cohesion with 'sister' primary activities. The outcome may be a revision of the recursion/function table (Fig. 10.16).

12. *Aligning business, organizational and information processes.* Once the design of organizational processes is stable, it is necessary determining information provisions and requirements for the re-designed business process activities using the same approach as the one used for the existing process in Fig. 10.12.

With the description of this general method, we are advancing ideas about how to align implementation business processes with organizational and information

RECURSION \ FUNCTION			Systems Support	Assessment of Information Requirements	Intelligence on Sources	Resources Audit	Choice of Information to Acquire	Negotiation with Information Suppliers	Contract Administration	Response to Enquiries	Sales and Marketing	Liaison With Other Bodies	Pricing	Staff Training	Recruitment	Personnel	Financial Reporting	Capital Expenditure	Budgetary Control	Cost Control	Research & Development
COMLIS Ltd.			●	●		●			●		●	●	●	●	●	●	●	●	●	●	●
	Library Services		●	●		●					●	●	●	●					●	●	●
		Collection Acquisition	●	●	●	●	●	●													
		Collection Organisation	●			●															
		Information Provision	●			●				●											
	Specialised Reports		●	●	●	●					●	●	●	●					●	●	●
		Problem Definition	●	●		●				●											
		Information Services	●	●	●	●	●	●													
		Report Preparation	●			●															
	Online Services		●	●		●					●	●	●	●					●	●	●
		Data Capture	●	●	●	●	●	●		●											
		Information Processing	●			●				●											

Fig. 10.16 Proposed distribution of discretion for COMLIS

processes at the same time of providing a method to manage their variety in an organizational context. As the reader may have noticed, most of the methodological tools described throughout the book have being used in this section.

We now proceed to the final part of the book, which is focused on a problem solving methodology and systemic thinking.

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