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# Accelerating the Integration of People, Processes, Business Systems and Information

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If your change initiatives of deploying an End2End PLM system use an outmoded conceptual model like the 'organization as a machine' or the 'organization as a set of individuals', then you run the risk of:

- An **inadequate PLM deployment process** and
- The **creation of inadequate detailed blueprints** of desired changes.

People in this position may react with anxiety and resistance to change when, inevitably, events don't then proceed according to plan.

As a result, the system being deployed hinders day-to-day work, decreases productivity, and does not support the organization in producing innovative, high-quality and profitable products as expected. Organizations try to overcome these issues with iterative solution re-engineering, consuming a lot of resources. As a consequence organizations experience a slow change process and don't realize the full potential of their PLM tool.

Using appropriate models and organizational changes will accelerate the change process using fewer resources, causing less disruption and mitigating workforce frustration.

## 1. INTEGRATING NEW BUSINESS SYSTEMS INTO THE ORGANIZATION

Imagine having an innovative interface to a PLM system that provides a streamlined and intuitive user experience, seamless access to product data when and where it is needed, a comprehensive "big picture" view of the data and thus smarter decision-making.

It sounds like the new 'Land of Cockaigne', a place where all information needed to execute a task is conveniently to hand and where the 'harshness' of day-to-day work does not exist. The business systems are available; the bottleneck is the slow integration of people, processes, business systems, and information.

### WHY IS IT SLOW?

#### 1.1. HIGH NUMBER OF REQUIRED DECISIONS

Using a system like e-mail does not require an extensive ruleset to realize collaboration because the number of roles (sender, receiver) and actions (address determination, title and content) coordinated to run the software as intended, is quite limited.

However, deploying a business process with a new PLM system requires the organization to realign a number of interactive roles, executing multiple transactions to create new supporting procedures that fulfil the requirements of the business process. The number of decisions the organization has to make is proportional to the number of PLM system features utilized to support the execution of its business processes multiplied by the complexity and variety of those processes.

Even if a PLM system was smart enough to provide an agile product development environment that can be used by organizations, the number of decisions an organization has to make does not get smaller. It's only that the implementation of the decisions is not as IT skills dependent and IT resource intensive as it currently is.

Why is the integration slow? Because the number of required decisions the organization has to make is high.

## 1.2. THE INTEGRATION FACILITATOR

Up to now we talked about the organization as an individual running the integration of people, processes, business systems, and information. But in fact the organization selects people given the task to get the integration accomplished. Quite often the selected people are organized in a project with a PLM project manager role, dedicated project team members and ambassador roles as a steering committee.

Their collective task is to guide the organization through the change process to come to optimized procedures. The procedures must support what the strategy demands aiming to deliver more immediate ROI. They must also support real people solving real day-to-day problems. The PLM project team has certain views about how the organization works and based on their strategy they initiate the change. Consequently the integration could be faster if the chosen members of the team had appropriate models of organizational changes.

## 2. ORGANIZATION AS A MACHINE

Quite often the members of a PLM project team have a technical background. This might be one of the reasons of preferring the 'organization as a machine' metaphor, where the organization is understood to be a wheelwork with levers. An oversimplification of this model suggests that a PLM project manager needs to figure out the correct lever positions and then the organization changes accordingly.

In this scenario often the C-level management is understood to be at the right level of power and where only a command is needed for the organization to change. The PLM project manager then has to figure out the correct lever positions to get C-level management directing the organization.

Following this metaphor, organizations have, like machines, predictive behaviors. The knowledge of general patterns of change seems to be sufficient to guide an organization into a new practice using new procedures. If the PLM project manager does not have the knowledge, then he/she may acquire this understanding from consulting companies. The speed of the change is understood to be dependent on how knowledgeable the PLM project manager together with consultants is.

Experience has shown that change process in an organization has a strong momentum of its own and often interventions in one organization will not have the same effect on another. If the implemented change does not satisfy the expectations, then the machine metaphor implies that the PLM project manager or the consultants do not have the knowledge and they get blamed. This is demotivating for all involved people.

Following this metaphor knowledge about change process is a kind of a secret recipe, which is difficult to communicate or to learn. Managers or consultants sometimes claim to have that secret knowledge with reference to a successfully completed change process in an assignment at another company. Part of the secret knowledge is knowing what the 'right' reaction is to resistance to change. In leading the change process the PLM project manager and consultants have to direct the members of the organization in a clever way.

At times, the resistance to change can get so problematic that the organization stops the PLM implementation altogether and looks for another way to go through the change process.

## 3. APPROPRIATE MODELS OF ORGANIZATIONAL CHANGE

There are a lot of models which could be tested to get a better understanding of change processes in organizations and how to accelerate the process.

I would like to open up the discussion using the model of the German sociologist Niklas Luhmann based on the theory of social systems. Because a large part of Luhmann's work on organization (e.g. Niklas Luhmann (2000) "Organisation und Entscheidung"<sup>3</sup>) has not yet been translated from German into English, I recommend you look to David Seidl's (2004) "Luhmann's theory of autopoietic social systems"<sup>4</sup>, that describes the theory in detail.

In this white paper, only the elements of the theory that are directly related to our topic are used.

### 3.1 ORGANIZATION AS A LIVING SYSTEM

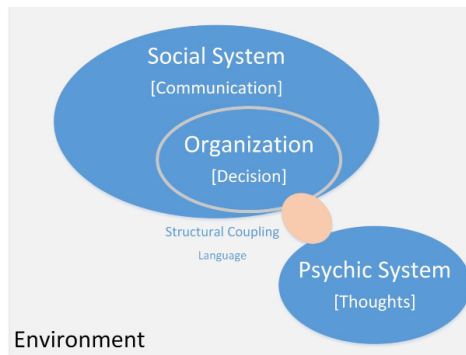
In the theory of social systems the metaphor of a 'living system' is used for an organization. According to Luhmann, organizations are a specific type of social system. The most basic element of the social domain is communication, meaning the social system only understands communication like software only understands bit sequences.

The boundaries of a social system are counterintuitively defined by the way that an individual human being in the social system is a part of the environment of the communication process and is modeled as a psychic system. The most basic element of a psychic system is thought just like electrical systems dealing with electricity are to software. The psychic system and social system are structurally coupled; an individual human being can stimulate the communication in a social system using language. The social system constructs in communications, the human being as a person, just like to couple software and electrical systems you need analog-to-digital or digital-to-analog converters.

The counterintuitive definition of the social and psychic systems has a big advantage; it allows for a clear separation of the analysis of social and psychic phenomena. In talking about change processes in organizations it is only required to take communications into account and it is not required to handle the complexities of individual human beings.

Organizations are part of the social system and embedded in the society. The most basic element is a decision, e.g. the decision of an organization, that a person is its member. Decisions are specific communications; the communication of a choice of alternatives the organization has. An example of a decision communication could be the organization selecting a specific person out of a number of applicants for a specific job.

Decisions define the structure of the organization being understood as a network of decisions, e.g. the organization chart or the supporting procedures. Even if the supporting procedures are not documented in detail or if they are documented but not followed, these are still decisions of the organization coordinating actors and activities. Organizations are operatively closed on the basis of decisions, because their decisions are only valid for



this organization. To come to a stable network of decisions, the organization takes - following Luhmann- decisions only in referring to other decisions or in other words the organization decides based on decision premises. This means, each decision is a continuation of the organizational decision communication process. Consequently decisions are the operational basis for further decisions, reproducing the organization self-referentially like a living system.

If an organization decides to introduce a PLM system, then it will take time for the network of decisions to adapt to the way that the PLM system is used in the organization for day-to-day work. This exactly fits our experience.

Because of structural coupling of the organization and psychic systems, each member of the organization can, as a human being, stimulate the organization to come to a decision. Consequently the CEO, as an individual human being, can like all other members of the organization stimulate decision communication. The only difference is that the members of the organization will listen to him more than to the others. But the organization only comes to a decision if the initiated communication fits to the decision premises or is connected to previous decisions. In other words, even the capabilities of a CEO, when it comes to decisions, are limited. This fits with our experience as well.

## 3.2 CROSS-FUNCTIONAL TEAM

If new supporting procedures are introduced into the organization, then they have to be developed based on decision premises of the organization, e.g. based on already existing supporting procedures reflecting the specific business process of the organization. If the current procedures are not defined and followed in great detail, (which is probably never the case,) then the organization can access the psychic system of its members executing the procedures to attain that knowledge.

To guarantee the fit to decision premises the organization can get, again based on the structural coupling of the organization with the psychic systems of its members, access to the competence, intelligence, and creativity of some of its members. To come to new procedures required to deploy an End2End PLM system the organization selects members from the involved departments, a cross-functional team, which knows the decision premises in the organizational domains of their members quite well, and consequently may come to decisions having the required connectivity.

## 4. CONCLUSIONS

In deploying an End2End PLM system the organization has to make decisions proportional to the number of PLM system features utilized to support the execution of its business process multiplied by the complexity and variety of that process. Most organizations limit the number of PLM system features they deploy and consequently reduce the number of required decisions. Taking the availability of business systems and their benefit for organizations into account, the strategy of decision process acceleration would allow a faster integrating of people, processes, and information with an extended set of PLM system features.

Because organizations are operationally closed and perform on the basis of their decisions, reproducing themselves self-referentially like a living system, a PLM project manager and consultants, as environment, can only stimulate communication in the organization, which may result into a decision for a next deployment step. There is no static knowledge of organizations, which allows the design and communication of new procedures following a

general approach. Trying to apply the static knowledge causes irritations of the organization, which result in decisions counterproductive to the integration intent and slow down the integration process.

Resistance to change is an observation from outside of the organization, the environment, e.g. individual human beings or consulting companies. It is a decision of the organization not to follow stimulations resp. irritations of the environment. Like all other decisions, the main purpose of this decision is the stability of the organization.

Taking the primacy of decision premises and required connectivity of decisions into account, consulting companies can support organizations in stimulating decision communication in the organization accelerating the integration process.

The main actor of the change is the cross-functional team, because of its domain knowledge of decision premises. It designs and communicates the decisions for new procedures and guides the organization through the change. If the cross-functional team is set up properly supported by consultants understanding organizational change processes, then the integration is accelerated as well.

Understanding an organization as a network of decisions implies a step-by-step deployment of an End2End PLM system and clearly rejects a big-bang deployment.

Understanding organizational change moves the focus from the business systems and their promising features to the integration of people, processes, and information with business systems, which challenges organizations. This understanding can enable the organization to a faster processing of decisions and consequently faster deployment of an End2End PLM system, because the number of irritations the organization faces is lower and the reaction to irritations does not require too many resources.

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Image: *The Land of Cockaigne, Pieter Brueghel the Elder (1526/1530-1569)*. <http://de.wikipedia.org/wiki/Schlaraffenland#/media/File:Schlaraffenland.jpg>