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Title of Paper:

How the concept of organisational value highlights corporate performance drivers. A systems dynamics teaching model

Associated theme:

Teaching systems concepts and dynamics in the K-12 grades, universities, and beyond

Didier Cuménal [1]

Summary

Numerous studies and publications focus on the concept of information system value analysis in industry. The purpose of this paper is twofold: 1) We have endeavoured to describe the as yet still rather unconventional concept of organisational value, demonstrating that both technical and cognitive aspects play a part in its construction. Not only are the components of this organisational value linear and static; they interact with each other over time. Our wish, in fact, was to study the evolutionary dynamics of this organisational value generating a greater or lesser impact on corporate performance; 2) We have built a teaching simulator (a "serious game") to illustrate how this systems dynamic works and to show students how the usually-concealed drivers of change generate this organisational value. The teaching value of the tool is to provide two modes of operation: the automatic mode, where the computer decides, and the manual mode, where the student decides alone or as part of a group.

Keywords: Organisational value, “teaching tool”, systems dynamics, decision, cognitive aspect

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Introduction

While many individual properties can explain an organisation's performance, these are rarely integrated together in models. And yet relationships and interactions are the factors that contribute to the improvement or deterioration of a company's results. While functional areas such as the quality, competence, ability and motivation of workers, production, finance, sales and marketing etc. are still too often areas that are separate from each other, each having their own logic of "vertical territory", modern management seeks to group these separate parts into a whole in order to reduce and unify these disciplines. Management, in fact, needs to be given meaning. All scientific progress tends to want to explain phenomena through a single principle, and this, indeed, can be seen in the gradual unification of physical sciences (such as electricity and magnetism). Nor, if it is to finally establish itself as one coherent discipline, can scientific management escape this change through the linking together of its disciplines. But what is the unifying principle, the attractor that enables us to assimilate these management areas – in principle dissociated – into a whole? Does it even exist?
This principle or unknown agent, which we shall call "X", comes from not only the pooling of several factors (technical, organisational, human, etc.) and all kinds of resources in general, but also the constraints facing the company. As such, it would be more appropriate to speak of nonlinear factors combined together (X*Y*Z). We see organisational value as the "intangible" element that adjusts and transforms these composite elements by giving them meaning. This encompasses socio-human factors (skill, motivation, etc.), material flows and physical layout (space); workers' responsibilities and tasks, relationships between workers via their tasks and work units, management rules, and information systems. Admittedly, financial capital and innovative techniques play a crucial role in establishing a successful business, but more than anything, it is the quality of its organisation that acts as a performance lever or inhibitor. A comprehensive observation of an organisation's strengths and weaknesses at a given time will not explain its results, because this organisational value – which we shall not qualify for now – is the result of the many and varied forces exerted on it over time.
Our purpose here is to develop a teaching model, one that we have called "MVO" ("Make Value in Organisation"). This will allow us to model and simulate the organisational value (in the sense of performance) and its effects over time. The systems dynamics will be the device, the tool that guides the student in his understanding of organisational complexity and his discovery of hidden performance levers.

Preambule: general considerations on the concept of value and performance

For the purposes of clarity, we define two terms in this presentation: the concept of value and the concept of performance.

Value

According to its common definition, the concept of value means the evaluation of possible ways to improve the performance of a product, a service or an activity while lowering its cost price. This discipline has been developed to identify the creation of optimal solutions within a product, service or activity; solutions that provide a sufficient (i.e. neither higher nor lower)

response to market requirements. It thus makes it possible to identify wasted additional costs when these needs go beyond functional requirements or the desired performances.
Value is determined and measured at a given moment, but, as P. Lorino (in 1989) mentions “we believe it should "adopt a new approach to value; one that, instead of seeking a law of value, is focused on finding a law for changing value." Later on, he states: "The change in value places the phenomena of knowledge (learning, innovation) at the core of economics." Indeed, we believe that what is important is measuring this value dynamic, particularly the evolution of its status over time, under the pressure of drivers and forces of change. This is one of the key aims of our model.
Creating value involves establishing a progress dynamic (the team "pushes" while the leaders "pull" the organisation) and a knowledge capital, the source of organisational value. The roles of knowledge management and organisational learning (capitalisation of skills) are thus essential for approaching the concept of value. Our model also endeavours to integrate this cognitive approach to value.

Performance
An organisation is high-performing if – and only if – it is effective and efficient. It is effective if it achieves all its objectives, and is considered efficient if it uses its resources and adequate means at the lowest possible cost, mainly for meeting its targets.
Both our model and simulations aim to highlight the value development factors affecting performance. Examples include productivity, the smoothing of production and supply capacities, the balance between human ability and the ability of machines under production constraints, the proper ability or aptitude of employees, the improvement of product design (the features requested), and the organisation's flexibility or malleability when dealing with the unforeseen in terms of activity, non-quality, recruitment, etc.

Taken from our model, the following tree diagram distinguishes the levers and brakes of organisational value. We can see that the many roots forming the base of the tree are actually interconnected within the causal diagrams referred to below. The value that generates the performance is the result of three levers:

1) Discrepancy with the quality required by the customer;
2) Discrepancy with the delivery date demanded by the customer;
3) Discrepancy with the usefulness perceived by the client.

Coupled with the price, this performance determines the value perceived by the customer. As is shown in Diagram 1 (below), these three levers are the result of many factors, some human, some organisational and some technical.

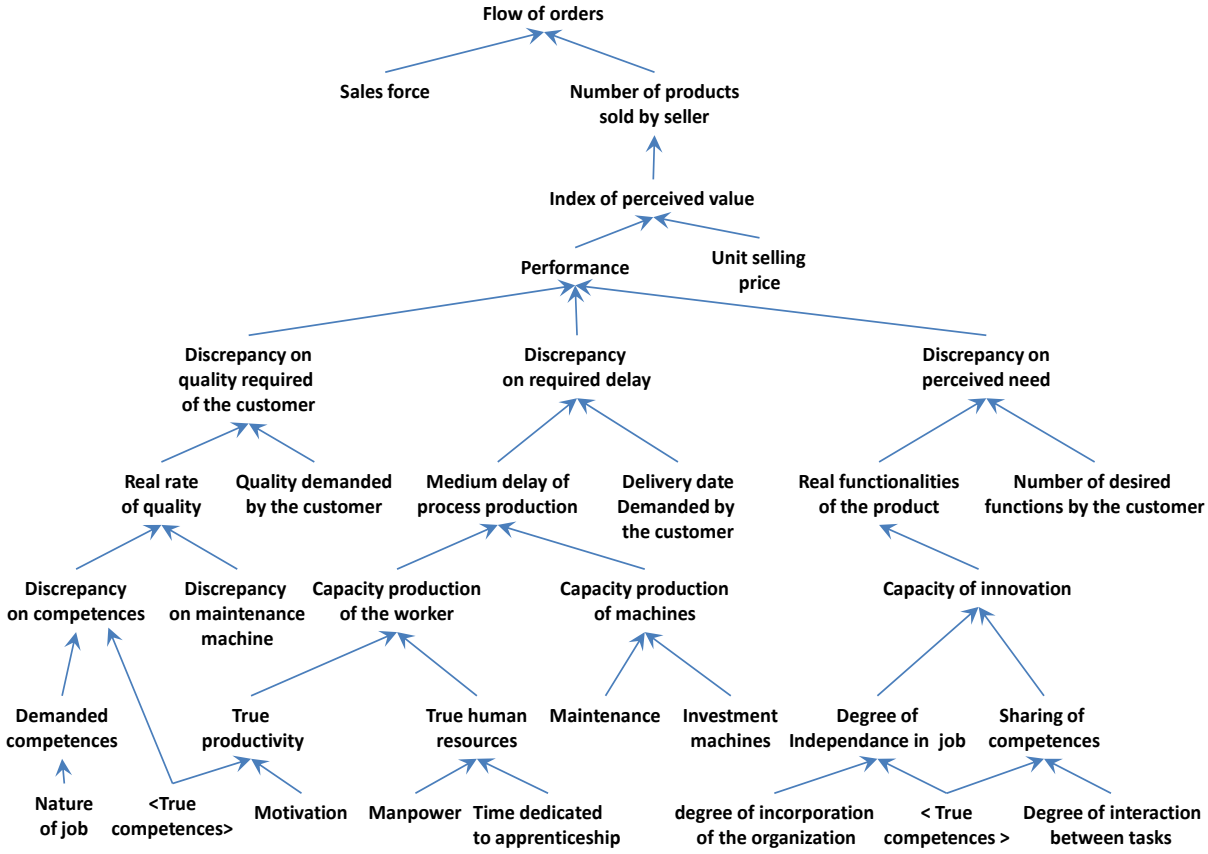


Diagram 1

It would appear that, in itself, value is a system made complex by the many interactions between its variables (see the general causal diagram below).

In our model, the "performance expected/price approved (by the client)" ratio is subject to a precise algorithm that measures the change in value over time. Thus value rises if the performance (numerator) increases while the price (denominator) remains fixed or falls, or if the expected performance far exceeds the price increase. In our simulation tool, we have covered the many other eventualities that exist.

1. The theoretical framework: Different concepts of value

Value is an ambiguous concept that has several meanings according to the picture we have of it. In the most empirical sense of the word, value is what the user is willing to pay for a product (P. Lorino, 1989). This simplistic definition, however, ignores the concept of creating value within the company. In a bid to define and narrow this concept, we shall distinguish in turn the shareholder value, the book value, the customer value, the strategic value, the value of information systems projects and, finally, the organisational value, which is the theme of this presentation:

- **The shareholder value** concerns a number of financial relationships that exist between business leaders, supervisory boards, boards of directors and, of course, the stock markets, where shareholders are omnipresent. Moreover, some authors prefer to evoke the concept of "stakeholder value" so as to include the immediate proximity represented by the other stakeholders of the company. This is called the convergence of goals (Albouy, 2000). Shareholder value is extended to all partners (subcontractors, the State, customers, suppliers, banks and, of course, the company employees). It is therefore the partners' combined efforts that "pull" the organisation in the same direction, creating economic value.

- In France, **the book value** is based on the asset value reflected in the balance sheet. It is a value based on the historical cost of assets, not the market value. Normally, fixed assets are recorded at the purchase price minus the normal depreciation (net book value). We prefer the concept of fair value, which provides better information on current and future performance and, consequently, ensures shareholders more effective monitoring of executive management. This value fluctuates, however, and can even be volatile, and recent events during this current financial crisis serve to remind us of the fragility of this concept, particularly for banking institutions!

- **Value perceived by the customer**
  This depends on a relationship that takes into account the performance expected (conforming no more and no less to the functional needs expressed, the quality required and acceptable timeframes) and the price approved by the customer.

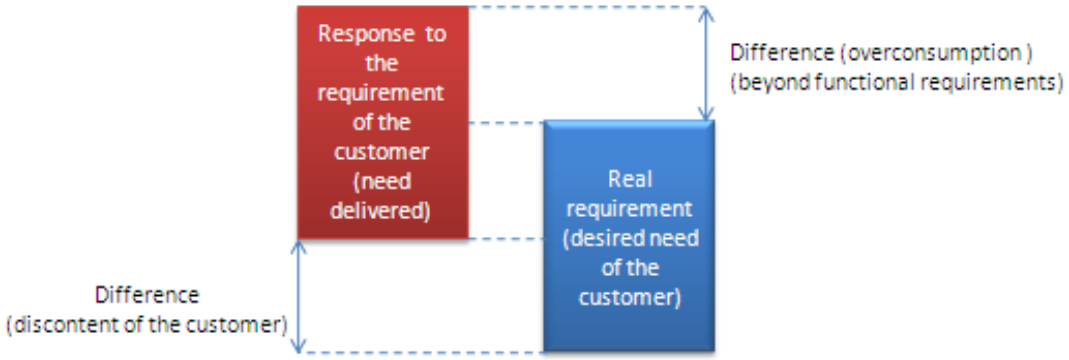


Diagram 2

The value increases when performance increases (at like-for-like prices) or, better still, if the performance increases but prices go down. There are other possible cases that we can model using the following ratio:

$$\frac{\textit{Performance expected}}{\textit{Price approved}}$$ by the client

Creating customer value therefore entails maximising the ratio between expected performance and price. Since it can vary from one customer to another, we note that the concept of customer value is entirely relative. This is why we talk about the concept of perceived value.

- **Strategic value**
  This concerns the relationship between the internal potential of the company and its environment. This potential is the result of activities (jobs) and resources combining to offer a competitive advantage. This trend is discussed by many authors: M. Porter (the value chain), Ansoff, etc. The global optimum, however, is not equal to the sum of the local optima (vertical business functions) and this is why Porter focuses mainly on controlling a company's value chain through its links and from a transverse or cross-functional perspective.

- **The project value of information systems ("IS")**
  This concerns the alignment of information systems with a corporate strategy. It is a very current concept because of the project management boom. It entails answering the following three questions:
  What is the contribution made by each activity (integrated into the process) towards achieving each strategy?
  What is the contribution made by each "IS" project towards improving the performance of each strategy?
  What is the value of each "IS" project (the relative cost performance of a project)?
  It thus compares the concept of performance (the contribution made by projects towards improving the performance of activities) with the cost that has been generated to achieve it. The table below enables business leaders to prioritise within a project portfolio:

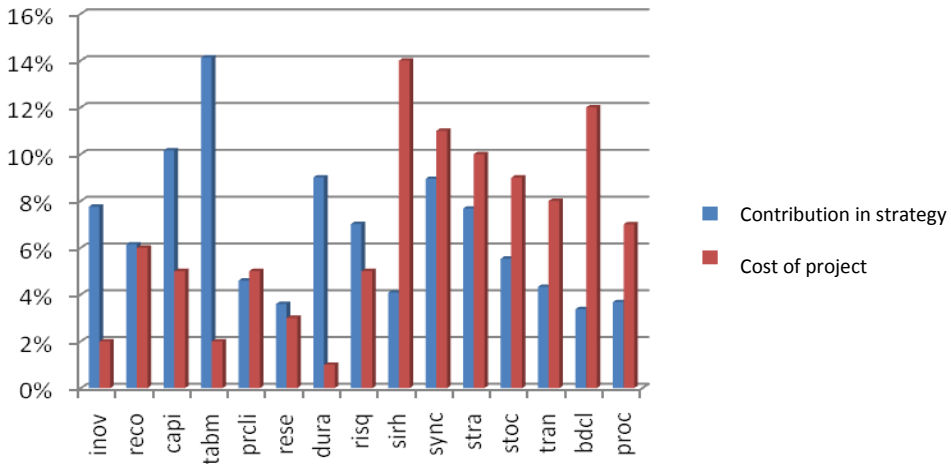


Diagram 3

We can see from the above example (Diagram 3) that, when compared with the Human Resource Information System project (French acronym "SIRH" or “HM Information System”), the managerial dashboard project (French acronym "TABM" or “BSC”) has both a greater contributory value and a minimal implementation cost. Human Resource Information Systems do not in principle feature in the strategic target of business leaders, at least not in this presentation.

- **Organisational value is tackled from several points of view.**
  It is approached from several points of view:

  - In their transaction cost theories, R. Coase (in 1937) and then O. Williamson (in 1975) address the reduction of organisational costs. According to C. J. Dahlman (in 1979), we create organisational value by minimising costs for research and information (monitoring, market research, etc.), negotiating and decision-making (contracts, steering meetings, etc.), and supervision and enforcement (non-compliance screening controls).
  It is clear that the Internet and the new information and communication technologies (such as networks in and between firms) drastically reduce these transaction costs, and also lower the famous entry barriers described by Porter. But this purely economic approach underestimates the impact of the collective organisational learning process, where skills development is known to be a key factor in a company's progress and competitiveness.
  - Organisational and management processes and the Business Reengineering resulting from this approach (M. Hammer and J. Champy, in 1994) suggest that all it takes to create value is to identify sources of productivity with a "blank sheet" mindset (erasing everything and starting from scratch). These efforts, however, have often "damaged" human resources by wiping the existing slate clean. We know that rebuilding a skills portfolio is a lengthy operation. Process reconfiguration can only succeed if managers and workers both agree to a disruption in the running of their organisation.
  - The ability to organise and manage expertise. According to other authors (L. Edvinsson, M.S. Malone, in 1997), immaterial or intangible assets create competitive advantages that are difficult for competitors to replicate. The intellectual capital that exists in the form of knowledge ("knowledge capital") enables the creation of value and is the basis of the resources (resource-based) theory as well as approaches related to skills clusters, of which Nelson and Winter are the representatives. Interorganisational resources (the exchange of expertise between firms) show that learning, competence building and organisational abilities are the factors that ultimately create value. This is true insofar as it exceeds the visible aspects of financial value (the tip of the business iceberg), and especially if the shareholder gives the company time to develop its portfolio of skills (the hidden part of the iceberg below).

The iceberg metaphor (1/6 emerges: Finance)
Diagram 4

Professors St. Amant and Fox (2004) from the University of Quebec's Organisational Capabilities Research Group define the latter as "the deployment, combination and coordination of resources, skills and knowledge through different value streams to implement strategic goals." It is thus a question of activating knowledge, associating the different resources with each other, and adapting the organisation to create value. This is what is highlighted in Diagram 4 (above).
The scope of the model presented corresponds to the two submerged levels of our "iceberg", whose financial results are the result.

Our position:
The development of organisational potential (the combination of human, technical and information resources) transforms the organisational value at the same time as this change affects the potential. Taking this systemic assumption and this feedback loop as our starting point, we have developed a teaching model for students that highlights the concept of organisational performance. Consequently, the assumption that we are putting forward is that organisational value is a determinant of business performance, both economically and socially. However, literature on this subject reveals that this is not only limited to human behaviour. Indeed, several authors tackle organisational value by emphasising the quality of the management and the way the organisation is run (working conditions, work organisation, communication, training, time management and strategic implementation: L. Cappelletti, 2004 and 2005). These models are static (a snapshot of certain factors characterising the state of the organisation at a given time). They are often constructed using interviews that enable a diagnosis of organisational failure to be established from several grouped measurements. They then try to remedy these deficiencies. The underlying assumption is that eliminating deficiencies is a way of generating value. However, the results presented do not make it possible to show how the combination of many diverse variables transforms the organisational value (dynamic aspect) over time. Certain studies[2] focus on the human potential to create value (the resource-based theory). Other authors explore the relationships that exist between different sectors of activity, in particular by linking organisational learning with the company's performance and strategy[3]. But all these approaches have difficulty in giving unity and meaning to the concept of organisational value as perceived by customers, and stick to generalities instead.
The model we put forward has a strictly educational purpose: to highlight the nonlinear interactions between the organisational components that produce value as perceived by the customer. This model therefore has two aims:
1) To enable students to discover and formalise the levers and brakes of organisational value and thus gain a better understanding of this concept;

[2] P.M. Wright, G.C. MacMahan and A. MacWilliams ("Human Resources and Sustained Competitive Advantage: A Resource-Based Perspective", in the International Journal of Human Resource Management, Vol. 5, No. 2, pp.301 - 326)

[3] R. S. Kaplan and D. P. Norton, "Balanced Scorecard: Translating Strategy into Action" (Harvard Business School Press, 1996) and more recently "The Trainer's Balanced Scorecard: A Complete Resource for Linking Learning to Organisational Strategy" by Ajay M. Pangarkar (Pfeiffer, 2009)

2) To highlight the counterintuitive effects that influence this value, starting from the managerial decisions taken by participants (boomerang effect in the medium and long term).
This model seeks to test the impact of a number of "boosters" and measure their sensitivity in terms of organisational value.

2. Presentation of the system dynamics model enabling the drivers of organisational value creation to be brought to light over time.

Methodology

Our methodology is based on the following five steps: Understand – Observe - Thinking. Decide - Implement.

Understand Functional goals of the model:

- Functional goals of the model. Highlighting the potential and value that trigger organizational performance.

Identify cost drivers to further develop the financial dimension of the model.

- Learning Goals. : How to build a systemic diagnosis, identify the problem (root cause), and explain why the organizational value fall or why does it become a performance lever.

Imagine the optimal situation and describe the inadequate situation. Assessing the resulting gap. One identifies, through, a question, the issue to be solved (problematic).

Observe (Structured Situation):

Search for subsystems which, through their interaction, can explain the levers and barriers to organizational value. It is based on academic literature and experience of management of the author. It identifies the variables linking subsystems. Within each subsystem we list the variables related to the objectives of the model.

Thinking:

- Building causal and dynamic diagrams within each sub-system.
- Running the simulation. Validate (test sensitivity) and build scenarios (fracture, trend, etc.).

***Decide*:**

Analysis and selection of the scenario from the objectives and risks

Implement and specify the scenario:

Submit recommendations for policy development (implementation of feasible and desirable changes in the real world).

2.1 The model's subsystems

In Diagram 5 we have shown nine subsystems, all of which are interconnected by link variables represented by the arrows, and also carrying a short description. The system described is a feedback system capable of regulating itself in time through a mathematical formulation based on the feedback loops. We have developed algorithms that allow the simulator to decide automatically. These algorithms are based on the analysis of differences between the desired level and actual level. Furthermore, the desired level is a variable that reacts according to the decisions previously taken. Constantly, they seek to minimize this gap by taking decisions. However, they are not always optimal. The automatic mode – where the

student only sees the decisions taken by the teaching simulator – is based on this principle, while the manual mode allows the student to intervene directly and simultaneously on several variables. One of the striking features of our model is the fact that it takes subsystems into account: Organisation and Innovation in Business Performance Development.

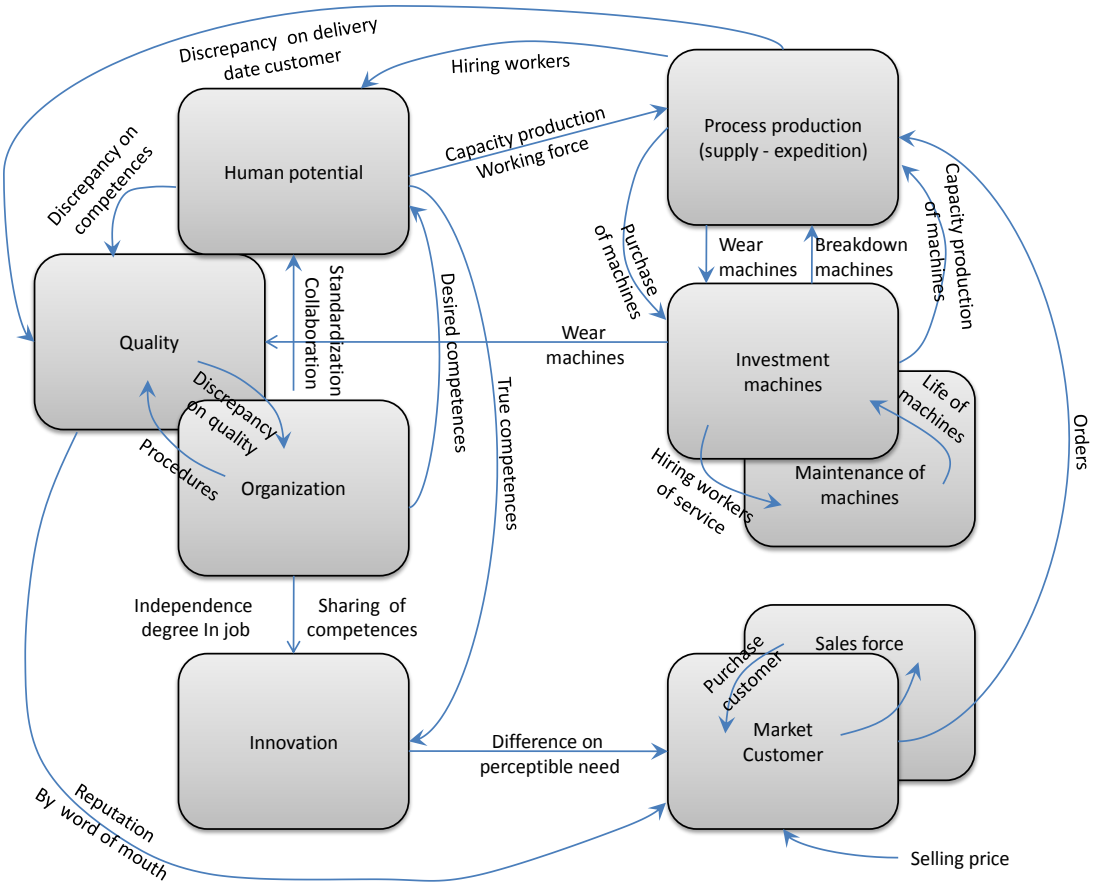


Diagram 5

2.2 The general causal loop diagram

Using a general causal diagram, it is not easy to represent a model that currently includes 270 variables (including 33 state variables) and 410 relationships between them. Nevertheless, we have shown a general causal structure that allows us to identify the key drivers of organisational value change. The model was developed on the Norwegian software Powersim Constructor and is currently being converted to the new version, Powersim Studio 8, as well as on Stella 9.1.3.

The causal diagram enables interaction between the technical components (the supply and production processes, and investment in machinery and maintenance) and the cognitive factors (skills, workers' motivation, autonomy in the work place, etc.), showing how the organisational value is formed and can evolve over time. One of the model's particular advantages is that it integrates the capacity for innovation and the role of the organisation. The latter is the subject of a strategy within the model, in the sense that the student has to define the organisation's parameters by describing the mission of the work units, the scope of

team supervision or management (level of control within the organisation), the nature of the task (production) and the intensity of the procedures.

We shall describe some feedback loops in the diagram 6 below.
- To begin with, we can see a first loop telling us that the size of the order flow determines the desired level of machine production capacity, which, in turn, determines the maintenance of these machines. This has an effect on the quality, which is a component in the performance expected and contributes to the organisational value. We can also see that the perceived organisational value impacts the order backlog.
- Stemming from the orders, a second loop determines the change in performance: orders – desired staff → total staff → capacity production (working force) → process delay (supply and production) → discrepancy on perceived delay → performance → organisational value →orders.
- Another loop that determines the organisational value's sensitivity is the one that takes the capacity for innovation into account: functionality provided → discrepancy on perceived need → performance → organizational value →orders → desired staff → total staff → qualified staff →discrepancy on competences → capacity of innovation → functionality provided.
We note that the capacity for innovation depends on other parameters such as motivation, competences and the degree of autonomy in the work place.
There are many other relationships that can be examined in Diagram 6 below.

Finally, let us take a look at the colour of the arrows. Blue means that a variable evolving in one direction is leading the variable at the top of the arrow in the same direction, symbolising the causal relationship. So, if variable A increases or decreases, variable B follows the same upward or downward movement. The red arrows show the opposite relationship (or movement in the opposite direction). If A increases, then B decreases, and vice versa. With the aid of these colours, in Diagram 6 we can detect amplification feedback loops or inhibition feedback loops, which counteract the system's development.

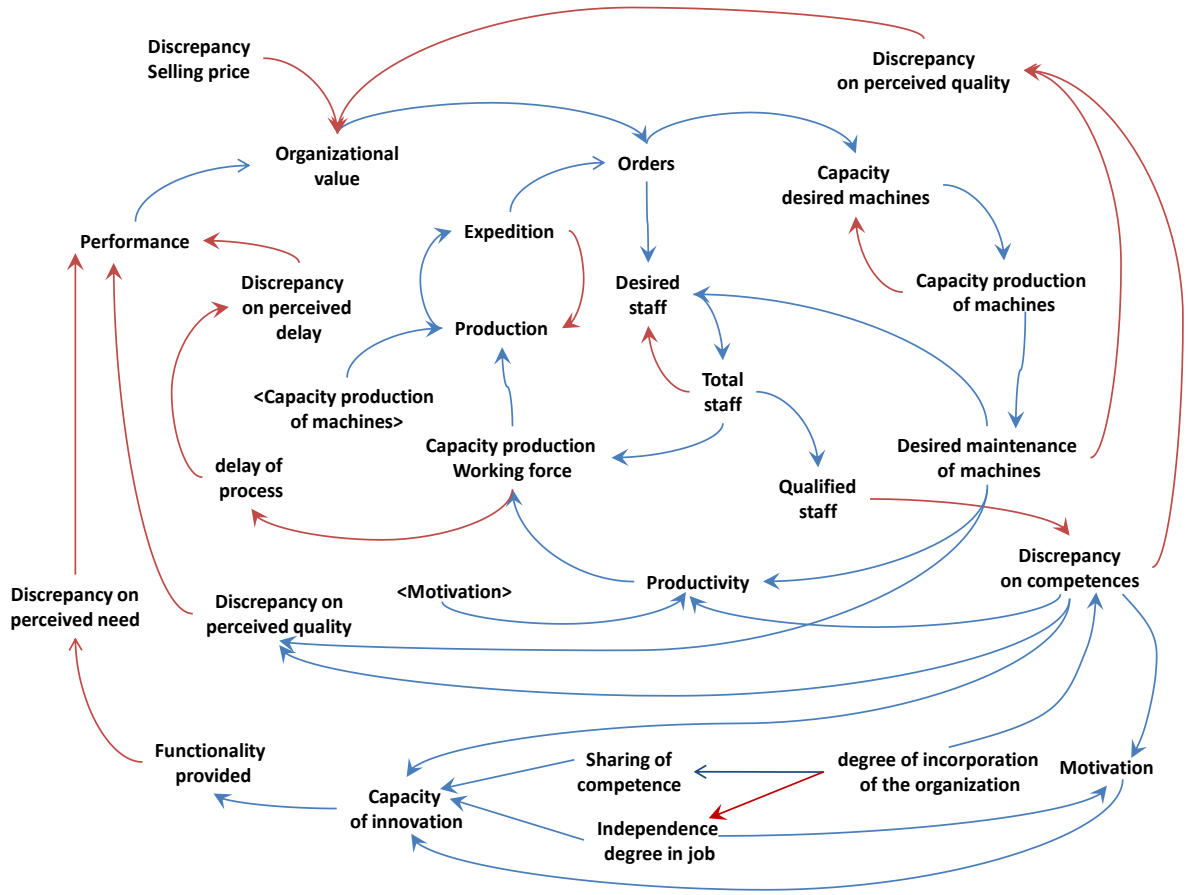


Diagram 6

2.3 The interface and the simulator's "Management Cockpit"

There are six screens which help to clarify the development of organisational value and, consequently, the company's performance. Attached to this paper is the educational software that illustrates these views.

One of the screens represents the teaching simulator's ergonomics and mode of operation. What we have here is the command process, whose perimeter extends from the supplies right through to the shipping of products, incorporating the production sub-process.

Simulation is carried out step by step, i.e. about once every two days, or continually, year by year, for up to four years. The model's equations are finite-difference equations that are solved using the Euler polygonal approximation method.

We can note the "simulation method" command: this asks the student to choose between the automatic simulator mode, where the computer decides on its own, or the manual simulator mode, where the student makes the decisions. The button labelled "production method" allows the student to choose between "production pulled by order" or "production pushed by stock". As can probably be noticed, the process is characterised by an arrow: acting as a gauge, this arrow serves to measure the quantities (specified above) and the timescales (specified below). The student should pay particular attention to the production volume he wishes to launch, bearing in mind the production capacity of not just the machinery, but also the workers.

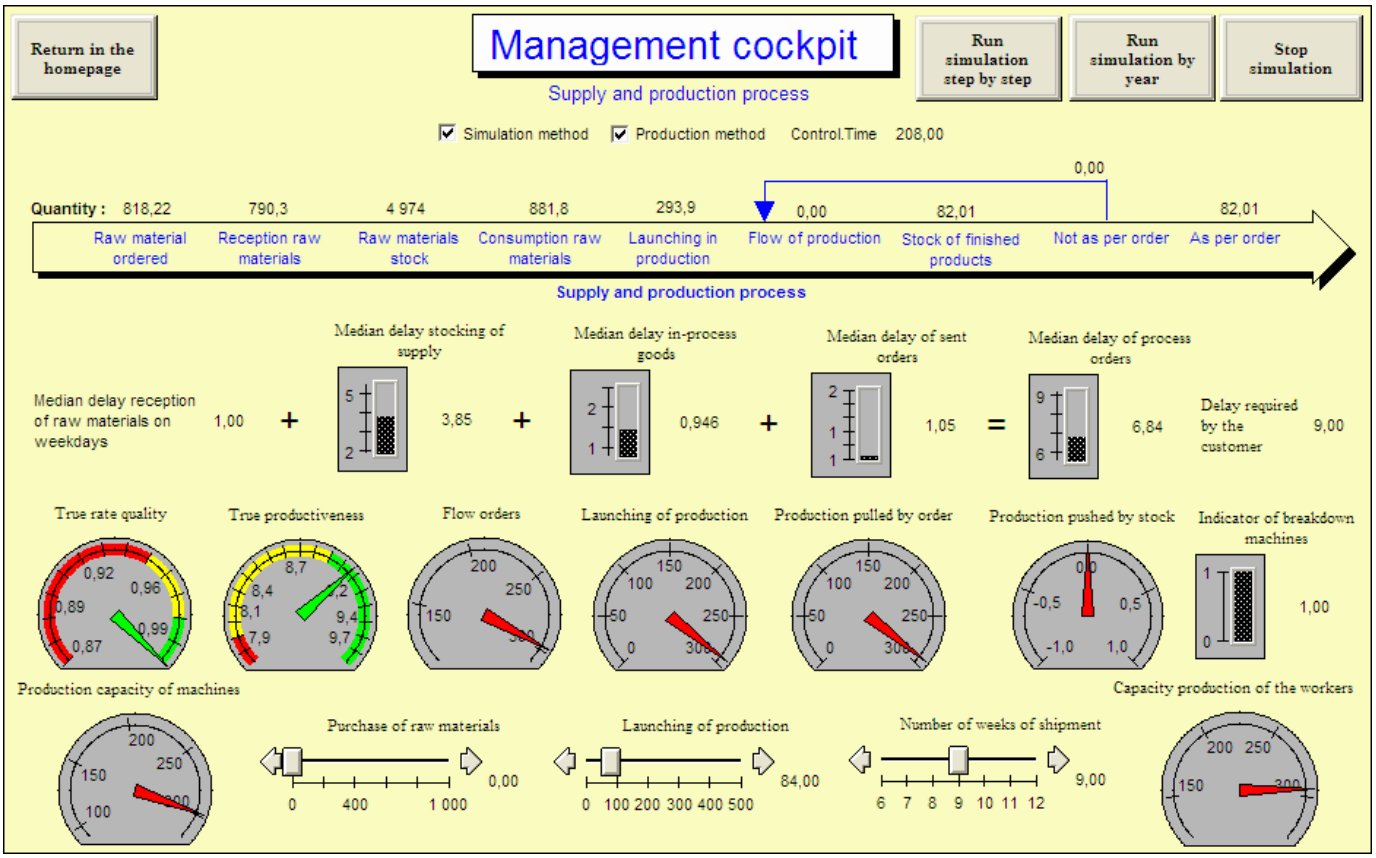


Diagram 7 (an example of how the screen might look)

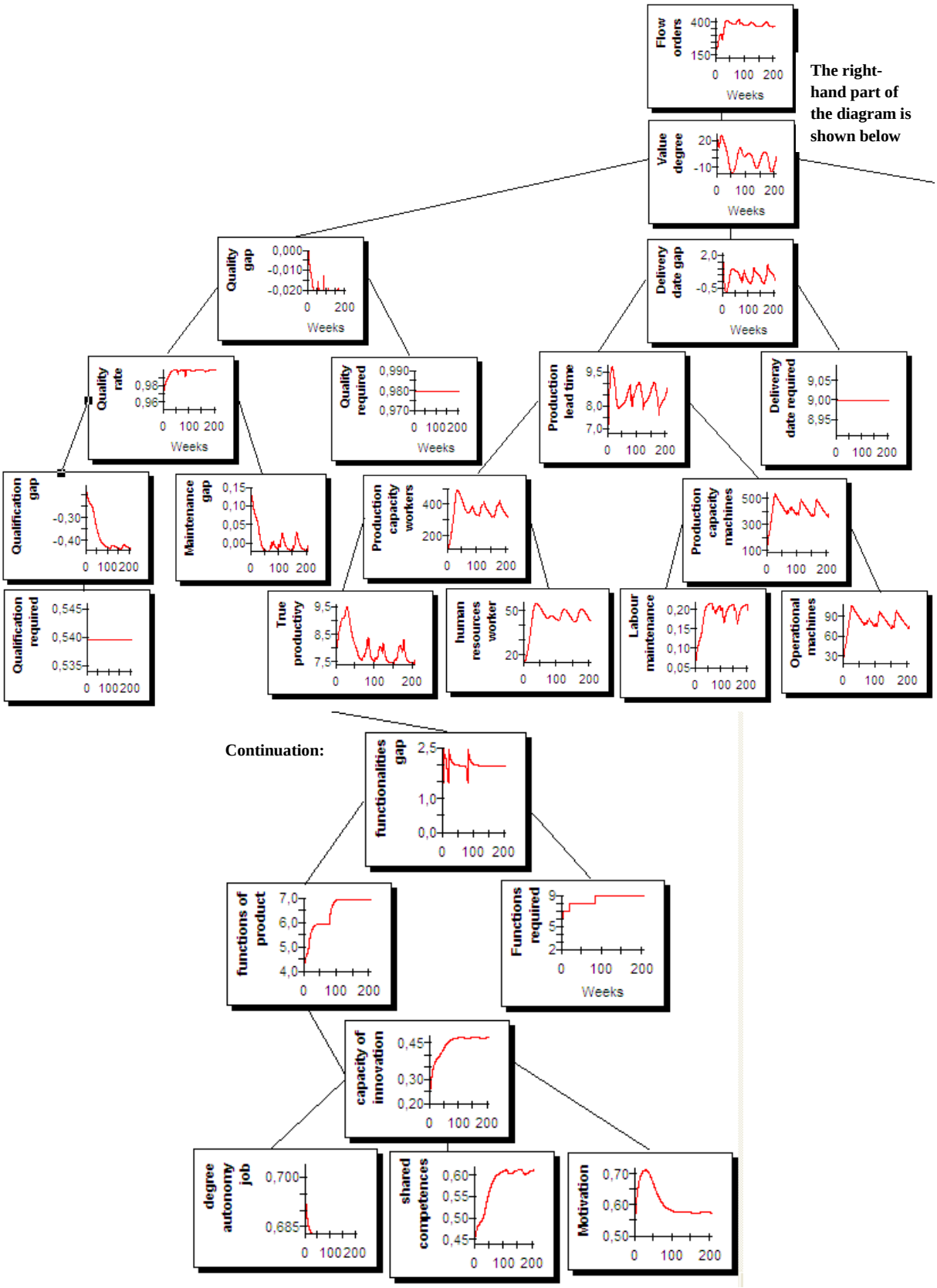
2.4 The simulator's teaching logic: three scenarios operate the assisted mode (automatic) and the manual mode

The model is based on a teaching structure that operates as an interactive tutor, putting questions to the student. We took inspiration from the writings of two pioneers in this field: Hartley and Sleeman (in 1973).
We can break this structure down into four modules:

- The field expert,
- The student's model (his performance and skills),
- The teaching module (the tutor and model)
- The man-machine interface.

Our simulator represents the running of an industrial enterprise (microworld) in accordance with the nine sub-systems presented in Diagram 5 (above). Students are offered three learning scenarios:
- The first deals with understanding the interactions between the different variables that contribute to a company's performance. Here, it is the computer that carries out the simulation and decides what action to take – for example, recruitment or machinery acquisitions – starting from the inhibition and amplification loops that have already been stored in the model. Simulations are carried out on a yearly basis. We invite each student to build relationships between the variables using the gauges or indicators found on the six simulation

screens. The form of presentation for these relationships is free and all types of diagram are possible (linear process, non-linear process, tree classification of variables, etc.).



The right-hand part of the diagram is shown below

Continuation:

Diagram 8

For example, in Diagram 8 (above) we have shown a tree-like exploration of the variables, taking the previous Diagram 1 as a starting point.
The student is asked to analyse and comment on the dynamics of organisational value development over time. He is asked to identify the levers ("boosters") or variables that, in his opinion, have a significant impact on value. This is a sensitivity analysis study.

- The second scenario involves disconnecting the simulator's automatic mode, thus enabling the student to make the decisions. For this, the model is divided into five teaching modules, all of which are independent from each other. The student follows a learning logic with the following sequence: 1) logistics/production; 2) machine investment/maintenance; 3) human resources; 4) commercial development and 5) organisation. Human resources and organization trigger off effects counter- intuitive. The students are surprised by the long-term important results.
The simulation is carried out step by step (every two days in simulated time). The aim is as follows: over the medium term (one year), the student has to measure the counterintuitive effects and the decisions that he will make in every sub-system (independent of the others). He is therefore required to integrate time into his reasoning. The computer tool that we have developed uses the Socratic Method based on the question "why", through a series of questions put to the student by the system. Using messages, the simulator suggests to the student possible causes for the successive changes in organisational value. This is an interactive learning system where the teacher is also very present. The student is then asked to formulate his answer using causal diagrams, formalising the feedback loops studied at the start of the second teaching session.

- For the third teaching scenario, several students are asked to form a work group of no more than five people. The sub-systems are now interconnected, and specific roles are assigned to the individual team members. This means that there is a logistics and production manager, a human resources manager, a person in charge of machinery investment and maintenance, an organisation advisor and a sales manager who is also in charge of the sales force. One of the key messages addressed to students highlights a well-known principle: "a system's global optimum is not equal to the sum of its local optima." This scenario helps to break the ice between the people in charge of vertical functions by encouraging students to integrate their policies into a comprehensive strategy and thus develop a systemic spirit. The communication aspect broadens the students' vision, and reveals archetypes in the form of models and emerging paradigms.

3. Findings

In this paper we introduce two aspects: First, we analyze the simulation results; secondly we study the profile of students in decision-making by successive two control groups of students

3.1 Summary of results (simulation)

Diagram 9 shows a scoreboard graphic characteristics on several variables, such as: production and inventory, production capacity of industrial machines, the work potential of employees assigned to these machines, the skills required to perform the work and actual skills of staff, the total time of the logistics process (supply, production and shipment), the quality generated by the production, motivation, degree of standardization of the organization's autonomy and job complexity of the task, the value perceived by customers, the reputation of the company, the degree of innovation (number of product features in line with customer requirements), the number of employees…

Around the 75th month, we can see that the machine capacity is saturated. This triggers a machine breakdown and a quality problem. Again the same event is repeated to the 175th month. In other periods, a gap appears between the ability of machines, the potential of men and customer orders. This may suggest an investment problem or maybe a poor staff management. The value perceived by customers varies over several years. There is a gap between the competencies required by the organization and the actual competencies of employees. Students are asked to explain these results by linking these variables. For example, why is the value positive? What are the consequences of organizational change on firm performance?

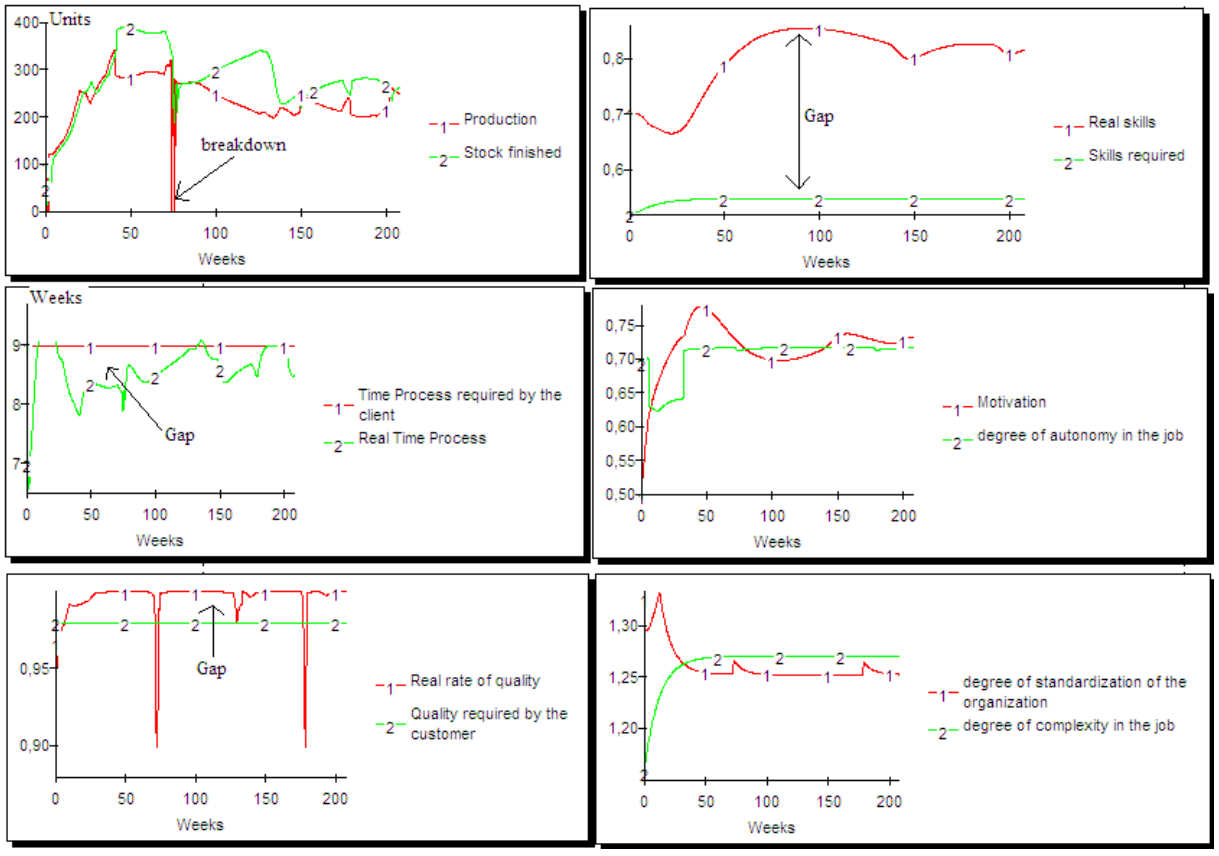
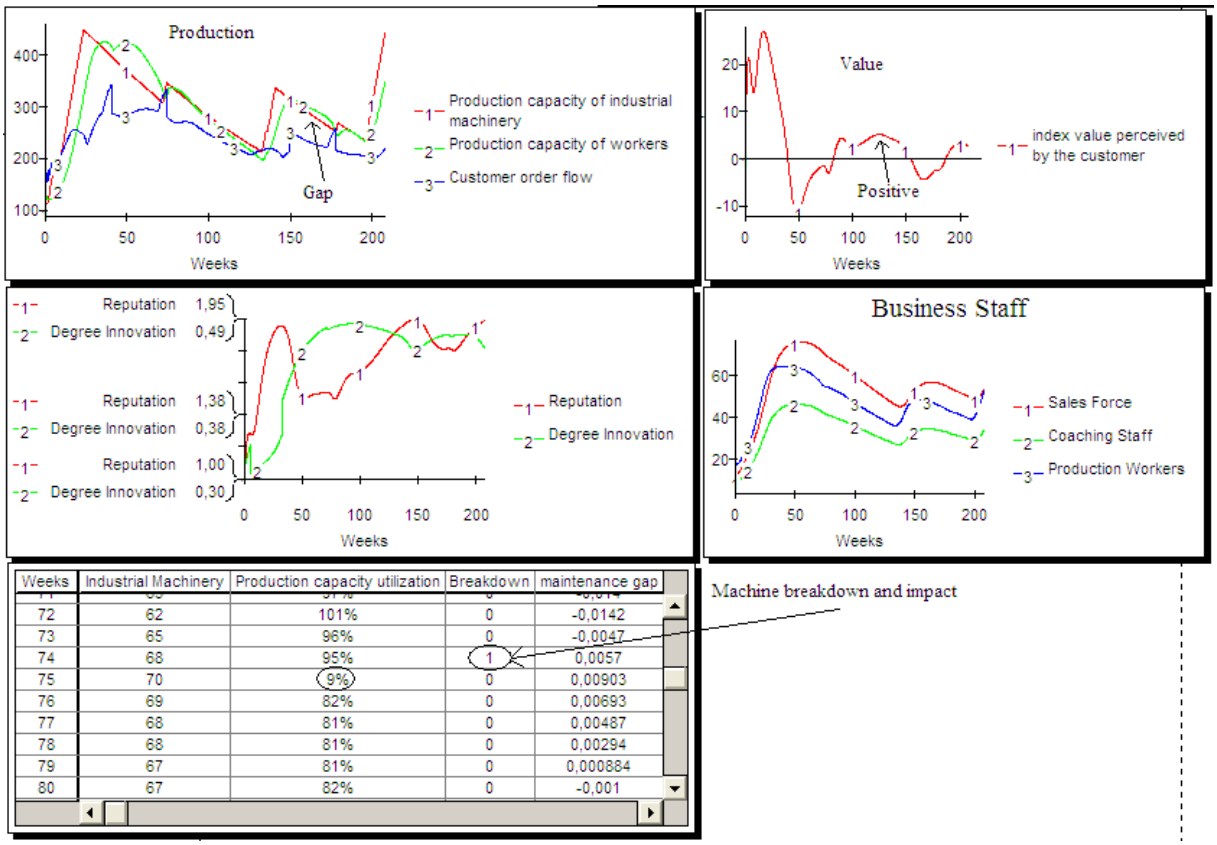


Diagram 9



Weeks	Industrial Machinery	Production capacity utilization	Breakdown	maintenance gap
72	62	101%	0	-0,0142
73	65	96%	0	-0,0047
74	68	95%	1	0,0057
75	70	9%	0	0,00903
76	69	82%	0	0,00693
77	68	81%	0	0,00487
78	68	81%	0	0,00294
79	67	81%	0	0,000884
80	67	82%	0	-0,001

Diagram 9 continued

3.2 Pedagogical implications

It is a pedagogical model based on management theories. This article focuses on strategies for decision making, incorporating the organizational dimension. This is its strong point. Thus this model allows to choose a target organization as hierarchical structure (vertical coupling: manager and employees); Functional Structure (low lateral coupling: functions and sub functions) Business Unit Structure (structure with business objectives: consolidation of units, functions, activities) Structure transversal projects (cross-functional).

The simulation was tested on several groups of students for several months in several Business Schools. In almost 70% of cases, we were able to distinguish two typical profiles from scenario 3, outlined above. We can see that Diagram 10 shows two abscissas: the number of questions put to the teacher (blue curve) and the number of decisions made by the students (red curve). We represented two groups illustrating these "portraits".

What do we find?

From the beginning of the simulation, group 1 put forward fewer questions than group 2, but, on the other hand, made more decisions. An inversion of the curves occurs at the end of the simulation.

Group 2 made fewer decisions at the beginning of the "game" but questioned the teacher more often. Furthermore, we found that Group 2 took the organisational dimension into account much earlier, and were quicker to integrate certain cognitive aspects drawn from learning, motivation and innovation, etc. into their decisions. The first group focused much of its

attention on logistics and production. Only later did they begin to measure the importance of the human and organisational aspect.
Finally, Group 2 obtained better performances than the first.

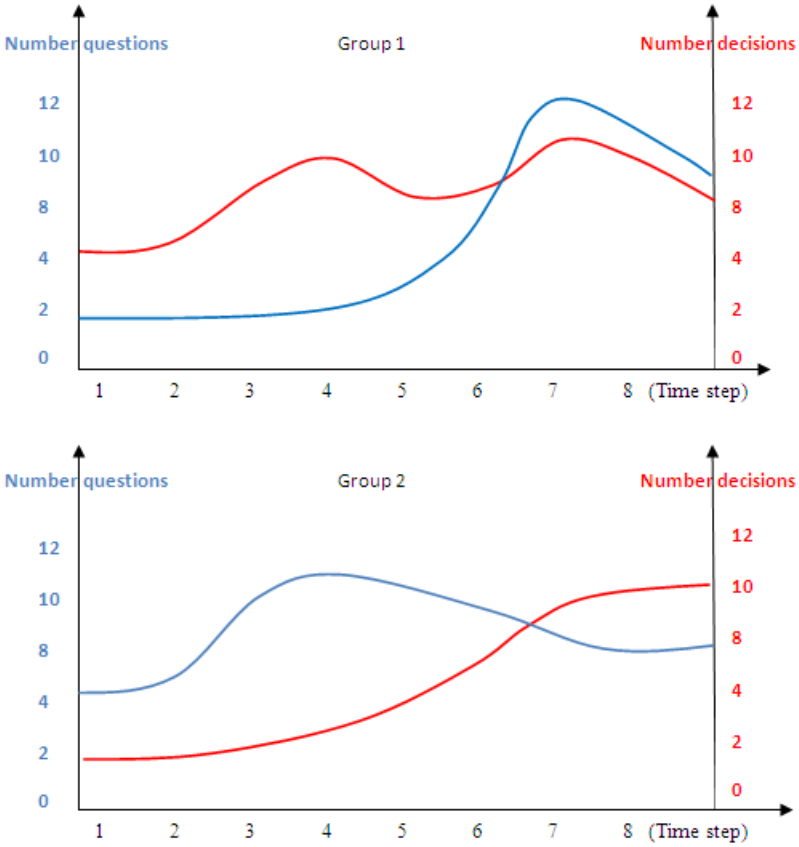


Diagram 10

Conclusion

Having explained the concept of organisational value and analysed its components, we have presented a simulation tool that enables its changes to be measured and understood over time. Our model factors in a number of cognitive and human variables involved in determining this value. This has an advantage over other simulators, which are typically confined to production activities, business management or even staff management. We therefore feel that taking organisation and its effects on company performance into account is very important in improving students' understanding.

Our model is an interactive teaching tool that gradually enables students to build up knowledge between the different areas of the company. It also allows them to integrate human and organisational aspects that are not always visible.
The next development of this simulator will focus on the financial aspect, i.e. the tip of our iceberg (see Diagram 4). We hope in particular to work on the modeling of hidden costs, the "phantom costs" that play an important role in the formation of results and, in terms of teaching, show students how human influences and organisational changes contribute to the failure of rationality, which unfortunately remains a very current issue in Finance.

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