

# Management in the Age of Complexity



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## Business, management and governing principles

Nobody would dream of building a nuclear submarine or a space shuttle without knowledge. Scientists and engineers make these achievements possible. This is because there are laws of physics that govern events as well as mathematical reasoning and tools designed to interpret and plan around those laws. Travelling through deep seas and outer space is made possible by knowledge – what we can refer to as an *epistemological framework*.

Business and management are complex activities of human interactions with material and immaterial resources. These interactions are also governed by laws and principles.

There are scientists, philosophers and engineers who have contributed their knowledge to allow people to understand and interact positively with the laws and principles that govern business and management. Surprisingly, far too many people work every day in business and management **without sufficient knowledge of these principles**. They lack an epistemological framework. They base their actions on “experience”, or to be more precise, they act *empirically*.

When entrepreneurs and managers acquire the necessary knowledge, method and tools, they gain a **distinct and actionable competitive advantage** over others who remain in the dark about how reality truly unfolds.

## Where your problems are coming from

Businesses are further complicated by the fact that, unlike submarines and space shuttles, they are living systems. The correct knowledge and methods will help us guide the sustainable growth of these systems appropriately.

**Regardless of the sector you are in**, the problems that your business encounters are “symptoms” of an underlying cause. Something is *constraining* the company (organization) in its efforts to do better. This is only natural because, like it or not, *every system has a constraint*.

When an organization doesn’t understand the nature and effect of a constraint, it can be tempted to resort to a “whack-a-mole” approach; i.e. try and “solve” a series of bottlenecks, thus wasting time and resources.

Whether what is constraining the organization is physical (like a machine) or immaterial (like the timeline of an acquisition process), **what truly limits us are attitudes and thinking that are no longer adequate**. In other words, a *cognitive constraint*.

It is crucial to understand what kind of cognitive constraint you are facing at any given moment; **in every case**, the path is to initiate the thinking process that enables a company (organization) to overcome the blockage that is keeping them stuck.

Examples of blockages:

- Production is too slow to meet market demand
- You are not able to sell all your capacity
- You are not able to innovate products or business model fast enough to keep up with changes in the market
- Company policies and measurements are undermining global performance
- Silos are preventing sufficient flow and speed
- Conflicts are disrupting performance
- You are not able to retain talent or next generation leaders
- Your projects fail to deliver on time and within budget

Correctly identifying a cognitive constraint enables an organization to adopt the suitable method and tools to:

- a) generate and enact an effective solution
- b) optimize the constraint and the use of resources, hence enhancing overall performance

## The basic elements of necessary knowledge

In order to conduct any business with a minimum level of complexity we need to create organizations. Most companies and organizations are built on a hierarchical/functional model purely because it's a familiar one.

Unfortunately, the hierarchical/functional model **severely sub-optimizes the efforts of all the resources in the organization**. This is because it does not correspond with how the work flow is actually carried out. It's rather like sending smoke signals to communicate because you don't know the telephone exists.

We believe that the basic elements of business and management knowledge that any organization should be based upon are:

- A. An organization is a system, i.e. "a network of interdependent components that work together to achieve a common goal". (W. Edwards Deming)
- B. Variation (and entropy) affect every human activity and must be statistically understood and managed
- C. An organization is not the sum of its parts – new properties emerge from interdependencies
- D. Every system has a constraint – the element that dictates the pace at which the system produces units of the goal (throughput). (Eliyahu Goldratt)

- E. Designing a system to optimize the functioning of the constraint is the most straightforward way to optimize the performance of the whole system
- F. Work is made up of repetitive processes and projects that require competencies
- G. Silos and functional divisions create artificial barriers to the workflow and generation of throughput
- H. Conflicts prevent flow
- I. The performance measurement system dictates how people behave
- J. Learning is not compulsory...neither is survival (W. Edwards Deming).

## Intelligent Management

There is always an opportunity to do fundamentally more and do it better.

Intelligent Management brings knowledge, method, tools and experience; we foster in organizations the awareness of a way to continuously access new possibilities and innovate. We transfer this knowledge in a systematic and orderly way through the [Decalogue Management Methodology](#).

Intelligent Management provides the knowledge-driven instructions that enable organizations to manage their cognitive constraints effectively. Please see a brief outline of the structured thought process underpinning the approach to understanding and managing cognitive constraints: [‘What Are the Thinking Process Tools?’](#)

## A few examples from the many companies we have worked with

### **Metal foundry with “physical” constraint in production**

A metal foundry had made a major investment in a new plant that guaranteed production of 100,000 tons per year. Despite their 70 years of experience in the sector, the client was unable to produce more than 80,000 tons. As they had not identified the constraint, they were managing a series of interdependent bottlenecks with all the subsequent inefficiencies. By helping them to identify and schedule the constraint in their production process, they were able to reach 100,000 tons within 6 months of working with the methodology.

### **New Product Development**

A multi-national, world leader graphite electrode producer was unable to avoid stub loss in the graphite electrodes they produced. A stub-loss-free electrode would have been a significant innovation and competitive advantage in their industry. By guiding their team of scientists through a careful analysis of the problem, we enabled them to surface all their assumptions/mental models regarding the issue to create a breakthrough solution. The new solution became an award-winning patent.

### **Speeding up Merger and Acquisition process**

A holding company in New York was faced with a time-sensitive task to identify and acquire a corporation. It needed to drastically accelerate the process of SEC approval to complete the acquisition in time or lose 150 million dollars raised from investors. The conventional method would have been to follow *best practices* (benchmarking) on dealing with the SEC. Instead, by carefully analyzing all the assumptions associated with following the conventional path, it became clear that the quickest path to a solution was to study the connected laws and align all interactions with the thought process of the SEC. This solution led to the fastest ever recorded acquisition by a SPAC (Special Purposes Acquisition Company).

### **Handing over a family business to next generation**

A well-established and highly profitable industry was stuck in an emotionally complicated phase when it was clearly necessary to hand over the reins to the next generation. The father who had founded the company could not delegate fully to his children. Following a rigorous, yet very emotional cause and effect analysis, we were able to guide the family through a systematic process of delineating a detailed solution, strategy and roadmap for a smooth transition that was satisfying for all involved.

### **Helping a Government Information Technology agency work more effectively and efficiently**

A government agency had become bogged down in its bureaucratic processes and knew it had to drastically improve performance to serve citizens more effectively and efficiently. Working with the methodology they identified the blockages in their thinking about the nature of their work and where the shift needed to happen in their mode of delivery. Within four months we worked with them to develop a full solution, strategy and roadmap to shift from an overly bureaucratic and hierarchical organization towards managing their work commitments as a Network of Projects.

### **Sales**

Very often, decisions regarding sales activities are driven by price/volume type considerations and a flawed understanding of market dimensions and typology of products and services that can be offered, given the skills and manufacturing capabilities present in the company. Over the years, we have helped a variety of manufacturing and service organizations to multiply their offering in every segment at a price that was profitable yet not disruptive.

### **Supply chain innovation**

Steel mills, steel service centers and manufacturers of steel-based products, especially in North America, are historically entangled in lose-lose relationships. While the time from molten liquid to a cooled coil is three days, the supply to the manufacturers very often exceeds ten weeks, creating a gigantic immobilization of capital in the form of inventory. By working with these three links in the chain, analyzing the cause and effect relationships and their underlying, often non-verbalized, mental models, we helped relevant players in North America to shrink the entire process to roughly two weeks.

### **Change in business model in mining (precious metals)**

Only a very tiny fraction of junior mining companies (prospectors) actually continue on to mining metal. They are acquired by mining companies, go bust, or simply give up. This is largely due to capital and organizational mindsets necessary to perform prospecting and mining. It is rather like transforming a group of 'mad scientists' into a fully functional and money-making corporation.

The Board and shareholders of a junior mine in the north west of the USA sitting on a bonanza grade of precious metal, in an area where no one had succeeded in mining in the previous 40 years and in close proximity to villages of historical value, decided to go the whole nine yards and become a fully-fledged open mine operation. After failing for four years and burning over USD 50 million, in less than a year of working with the Decalogue methodology they started to dig metal and in a few more months reached break even. This was made possible through a painstaking analysis of the mental models underpinning their way of thinking, especially in relation to change in scale of operations (from a handful of geologists happy to go out and poke holes in the ground to a 150-people full scale mining operation). From orchestrating a capital raise to the hiring and training of personnel through to all the operations connected with producing the ingots and shipping them, this transition was aided by a very carefully thought through Future Reality Tree and a masterfully executed project plan.

### **Turnaround of a multinational**

A failing American multinational was facing serious financial difficulties. They adopted our Decalogue methodology at a global level over a three-year period. This led to achieving measurable results in increased productivity, unleashing of untapped capacity, award-winning patents and a stock price that increased in value seven-fold.

## **The 'Network of Projects' Organizational model for complexity**

The knowledge and experience gained over twenty years of implementations of 'The Decalogue' has allowed us to develop an effective organizational model for systemic management in the 21<sup>st</sup> century.

'The Network of Projects' organizational design leverages Network Theory, Deming's theory and the Theory of Constraints to promote quality, involvement and flow within an optimized system.

Intelligent Management works with organizations to support them as they shift from the inadequacies of a hierarchical/functional model towards a truly systemic way of operating. By recognizing that every organization essentially performs processes and projects, companies that adopt a Network of Projects structure can expect to:

- Overcome business performance sub-optimization caused by silos
- Design effective interdependencies throughout the company and with the supply chain

- Synchronize the contribution of all available resources towards a clearly-established goal
- Capitalize on available talent and capacity
- Create very effective teams from a pool of competencies
- Deliver goods and services reliably on time and within budget
- Embed transparency and ethical behaviour into company processes
- Continuously improve Quality of goods and services, Involvement of staff and Flow of throughput
- Foster a systemic culture of continuous improvement and innovation
- Structure operations for decentralization and digitization
- Improve and optimize the performance of the whole system

The Network of Projects is universally applicable because it leverages the project-based nature of so much of the work that organizations carry out. It is highly adaptive and appropriate for the work of today's companies that are increasingly shaped by the demands of digital and decentralization.

## Working in an increasingly Digital and Decentralized World

Digitization is forcing companies to radically review and structure the way their processes work and to eliminate redundant actions and other inefficiencies.

Digitization dramatically impacts not just the way companies work to produce digital assets; it also leads to the digital supply chain becoming fully parallel and intertwined with the physical design, manufacturing and sales of products.

The competencies required to carry out projects are increasingly distributed around the world. This means that any conventionally hierarchical organization will always struggle to deliver when the flow of information and semi-finished outputs have to be assembled from disparate locations. What is required is a mechanism to assemble work produced elsewhere in a coherent, rapid and orderly manner.

Another element of complexity is that the value system and core beliefs of younger generations are quite different from those of people who have developed careers within traditionally hierarchical organizations. This contrast creates a need to combine a new way of organizing work with the changes dictated by digitization and the reality of highly decentralized sources of input into one cohesive way of running an organization. A solution can be found in the Network of Projects.

Digitization and decentralisation force organizations to rethink how they work in a radically different way as transactions multiply. The appropriate way of thinking for the new digital and decentralized economy has to enable fast and win-win conflict resolution and fair way of sharing economic gains. This can only be sustained if there is a mechanism of accountability

based on transparency and trust. Blockchain technology is leading the way and will provide the backbone for a new economy based on this paradigm shift.

## Are there any negative implications in adopting this methodology?

While it can often be exhilarating, working with a systemic approach to management is not for everyone. Discovering new avenues for how you think and approach problems is a process that takes you beyond your “comfort zone” and into unknown territory.

The fact is, nowadays we have to get comfortable with continuously upgrading our thinking to improve and innovate on an ongoing basis. This is the challenge that today’s complex market brings and The Decalogue provides a method to stand up to that challenge.

## How does it work?

We support leadership as they analyze their current situation, create a robust and systemic strategy, and build an implementation plan with a thorough project schedule based on state-of-the-art Project Management. The four main steps for this are:

- 1) Analysis of current reality: With leaders, we identify Undesirable Effects and the situation of blockage affecting the organization (Core Conflict).
- 2) Identify Breakthrough solutions: From the constraint of the current reality, we guide leaders to identify breakthrough solutions. These become major projects that create the transition towards the desired change (Future Reality Tree).
- 3) Build the implementation path: Using precise, well-engineered systemic tools we assist the managers involved to create a solid plan that overcomes all the obstacles on the path towards change (Prerequisite Tree)
- 4) Schedule and manage projects: Specific tasks are identified and their logic clearly explained (Transition Tree). These tasks are then scheduled based on finite capacity to ensure project execution is reliable (Critical Chain approach to systemic Project Management).

## How do we start?

Intelligent Management works with companies in North America and Europe.

What we recommend is an introductory conversation to explore scope and suitability of the Decalogue for your organization. This can be done in person or through a video conference. Please contact Angela Montgomery at [montgomery@sechel.ws](mailto:montgomery@sechel.ws)



## The Founders

Since 1996, Intelligent Management has partnered with scientists, technologists and innovation centers to deliver systemic management solutions for our age of complexity. Its unique *Network of Projects* organizational design has been chosen to build a global platform for a digital and decentralized economy based on transparency, win-win and fair sharing of economic gains.

[Dr. Domenico Lepore](#) is an international expert and innovator in systems-based management. For almost 20 years, he has produced significant results in a wide range of sectors in Europe and North America through his systemic management methodology, the Decalogue™ developed together with Oded Cohen, world-renowned expert in the Theory of Constraints. Domenico's background as an experimental physicist with expertise in Standards has provided him with a unique insight into the application of science to management to achieve robust, predictable and repeatable results. In addition to an effective management methodology, he has developed an innovative approach to organizational design based on network theory called the [Network of Projects](#).

**Dr. Giovanni Siepe** has a background in theoretical physics. His research work was on General Relativity and his results were published internationally. He has worked for many years in industry management and has developed patents in the field of microelectronics. He is an expert in the Decalogue methodology with a special interest in Statistical Methods and Critical Chain Project Management. He has over a decade of experience with international implementations of the Decalogue.

**Dr. Angela Montgomery** co-founded the first Decalogue company with Dr. Lepore in Milan, Italy in 1996. She is passionate about bringing systemic thinking for positive change to organizations. Angela has a PhD from London University in Literature and Science. She has published with Cambridge University Press, MacMillan, CRC Press and Springer. Her business

novel 'The Human Constraint' has been purchased in over 20 countries worldwide. Set in New York, the story chronicles the financial crisis. By fictionalizing several case-histories, Angela illustrates the power of a systemic approach (also through a hyper-linked Knowledge Base) and points the way towards a future of sustainable prosperity. See [www.thehumanconstraint.ca](http://www.thehumanconstraint.ca)

## Our publications

Over the years, we have communicated our approach to systemic management in a variety of ways. Our most scientific publication is a chapter we were invited to contribute to a volume on Complexity from Springer.

'[Managing Complexity in Organizations Through a Systemic Network of Projects](#)'. Chapter in 'Applications of Systems Thinking and Soft Operations Research in Managing Complexity', Springer, 2015.

Following in the footsteps of Dr. Goldratt, we chose to narrate an entire novel about management in 21<sup>st</sup> century.

'The Human Constraint'. A Business Novel with website, 2015. See: [www.thehumanconstraint.ca](http://www.thehumanconstraint.ca)

At the end of the 1990s, the unique blending of Deming and Goldratt into a methodology was first fully described by Domenico Lepore and Oded Cohen in '[Deming and Goldratt: The Decalogue](#)'. North River Press, 1999. This was further developed after a decade of implementations by Lepore et al in '[Sechel: Logic, Language and Tools to Manage Any Organization as a Network](#)'. Intelligent Management Inc., 2011.

We wrote our latest book because we were invited by CRC Press to give a complete summary of the Decalogue approach for complexity aimed at leaders and C-Suite executives. '[Quality, Involvement, Flow: The Systemic Organization](#)' is available from CRC Press, New York.

We also blog continuously at [www.intelligentmanagement.ws](http://www.intelligentmanagement.ws)

