

Reductionist Management?

Management is a very fundamental and pervasive human activity. Ever since the emergence of modern humans with our advanced cognitive capabilities, we have been able to create conceptual models of how the world is, how we might like it to be, and develop plans and strategies for achieving this desired outcome. Whether we are dealing with organizations of people, technology or natural resources and whether it is on the micro scale of managing our daily life or on the macro scale of coordinating a business or large projects, management is an ancient activity that we are all continuously engaged in.

Although people have been undertaking large enterprises for a long time, such as the building of great monuments and large irrigation systems, for most of history management has been considered more of an art than a science and it is only in the modern era following on from the scientific revolution and age of enlightenment that people have attempted to create a more formal and systematic understanding of it, based upon our new found scientific knowledge. The industrial revolution and the arrival of mass society necessitated a whole new approach to management as it became increasingly professionalized and specialized in response to having to deal with large and sophisticated forms of organization such as the modern nation state and large corporations.

Scientific management was an early management theory to come out of this period and gained widespread acceptance in analyzing and improving business organization and the workflows in factories. Scientific management is based on the work of Frederick Taylor who laid down the fundamental principles of large-scale manufacturing through the assembly line. It emphasizes rationalization and standardization of work through the division of labor. Fredrick Taylor looked at each step of production – breaking those steps into sub-steps – and recorded exactly how much time and how much motion was necessary to complete each task. By reducing the amount of motion the worker could get more done and productivity was increased. It was an idea that fitted perfectly with industrial age mechanization.

This approach to managing organizations that was born out of the industrial age (what we call reductionist management) has gone on to be applied to all areas of organization and it remains the default approach that we inherit today. So we will spend some time in understanding the internal dynamics of reductionist, thinking within management, and consider some of its advantages and disadvantages.

Firstly reductionism breaks systems down into their individual parts and focuses upon these well-defined components, so within management this involves the dividing of an organization or process into categories, departments or stages. By doing this we create component parts that can be isolated and measured.

By breaking a process up in this way we are also able to isolate the organization's components sufficiently to identify simple linear interactions of cause and effect. We can then use these simple cause and effect interactions to influence or control how the components function. We can measure its efficiency and control its output by manipulating its input. By using this method we can divide up a complex system like a large corporation into simple components that can be measured, controlled and thus managed.

This breaking down of the system into individual components then inevitably requires, at some stage, for us to put all the parts back together so as to achieve the end product or result. In order to achieve this, traditional organizations build a hierarchical pyramid, right at the top of which is one element that is responsible for integrating the whole system. Below this are a small set of positions responsible for managing and integrating the primary domains of the organization and farther down more people are responsible for more specialized areas and so on until we get to the front lines of the organization. Each level is responsible for the integration of the different set of functions beneath it.

In this way the organization can be coordinated from one centralized position. All components can be controlled through a direct line of command and measured through a defined set of metrics relevant to their domain. In order to manage the people within these positions, that are in themselves inherently complex, reductionism depends upon a model of the individual as extrinsically motivated. Key to this is the idea of rational choice, that is, when faced with a choice between one or more alternatives, human actors will make a "rational" decision based only on maximizing what economists call their utility. In consequence, their individual and collective behavior can be manipulated through the creation of incentive systems that reflect this.

This model of the industrial organization was developed in response to a particular environment that required the large scale, mass production of standardized products and services, in a stable and predictable fashion. Within this context the industrial model for organizations has, in many ways, proven itself highly successful. But faced with the changing environment of the 21st century, its limitations are becoming increasingly clear to us. So let's take a quick look at some of these limitations before we move on.

Firstly, Reductionism focuses on the static components of an organization and the metrics we apply to valuing them. In so doing, it systematically diminishes the space around and between them that is not measured. Thus, the system can become reduced to a simple set of metrics that are depleting some resource that may be more difficult to quantify, but is equally required to maintain the system in the long term. A good example of this is the failure of our metrics for economic growth to incorporate the natural resources it depends upon. The net result of this is a short-term profit at a long-term expense making the system unsustainable.

Secondly, inherent in the command and control paradigm is the idea that a person or few people in charge give the solution, that it is the only solution, to other people, who are in charge of implementing it. Thus the organization is heavily dependent upon the limited cognitive and information processing capabilities of a few individuals at the top of the hierarchy. This also reduces the capacity for the majority of the organization's members to take initiative, act autonomously and respond to local level information.

Lastly, the reductionist model to organization is built on the axiom of a relatively static system in a relatively static environment. The primary focus of this form of control is to remove surprise, to dampen down change and keep an organization moving stably through time according to the prior intentions of its members. All of these features mean that these systems are resistant to change, innovation and evolution, and thus, inept at dealing with dynamic and volatile environments.

In this section we have talked a bit about our traditional approach to management and some of the key features to the reductionist approach, including the reduction of complex organizations to simple components that can be measured, management as the control of the linear interaction of cause and effect that govern these components, and the use of a hierarchical structure and incentive systems as a means for integrating and controlling the organization. Now that we have talked a bit about complex systems and management we will move on to put them together in the next section on complexity management.