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What *kind* of management suits science best?

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Introduction

I argue that the ideal of free research versus the managerial model is a false distinction. Many different management models exist, and some of these are conductive of scientific research, as can be seen when we focus on the places of scientific innovation in the realm of industry. The real question is *which kind* of management should be applied at the university. When we look at places of invention in industry, we can see that not all companies have organized their research - as opposed to their production units - according to a stringent market rationality of cost, efficiency and production. This is because some managers of industrial research labs or managers in the creative industry were aware that this would cripple the creativity of their researchers. Unfortunately, the excessive bureaucratization and the imposition of a managerial ideal on the university by the government and administration is – ironically – based on an ill-fitting model of a market rationality based on production units in industry. This model of production and efficiency comes from the manufacturing industry rather than from the more relevant creative industry.
The origin of the current malaise, therefore, is in the imposition of the wrong management model on the university. There exist other models, however, that might be more fitted to the management of creative scientific research. I am looking for a model that can capture the specificity of academic science and that can serve as a guide for new management reforms. One of these is the idea of the 'knowledge commons', another is to see scientific research and education as part of a 'gift economy'. In my argument, I will develop the idea that university research should be seen as a 'gift' – although this model is now endangered by a market oriented approach, and this has important consequences. I will argue, against appearances, that understanding these deeper structural challenges to science is crucial for practical university policy. To see the university as part of a gift economy could be at the basis of new guidelines for management reform in the organization of higher education and scientific research.

What type of higher education? What kind of management?

The question we were explicitly asked to answer during this session was whether the university should be run like an enterprise. Now, the first thing I would like to point out is that 'the university', of course, does not exist. There are different types of higher education, and, I would also stress, different types of research institutes. Similar to making distinctions in the kinds of higher education and research, we should do the same with types of companies, enterprises and industries, and with different kinds of management cultures.

One relevant distinction here, I think, is a distinction between a manufacturing industry and a creative industry. For instance, the management culture at research units at Google or at small spin-offs will be very different from the management culture at McDonalds. So, I think the question is ill-formulated and the question should be "*What type of higher education or research needs what kind of management?*" Different types of institutes have different functions, and we need a plurality of institutes, which seems to be the best way to address a plurality of needs in society. We also need local solutions, not general ones. There is no good reason to think that a 'one model fits all' approach can work. On the other hand, an approach adapted to local needs should not be an excuse for provincialism, opposition to well directed reform or for bad management. In general, policy makers should aim at creating the best possible conditions for specific kinds of work, including *different types* of research and teaching.

What is the best kind of management for fundamental scientific research? That is the second question I would like to address. I think we should, in the first place, if we want to draw inspiration from industry, look at the creative industry and not at, for instance, a manufacturing plant. In the creative industry, research is not organized according to a stringent market rationality of cost efficiency and production, because in these industries, they are aware that this cripples the creativity of the researchers. Researchers in a real creative lab at the forefront of industry research also have freedom of research, they have time for creativity, and there is space for error tolerance. There is no talk about standardization or strict accountability. From the 1950s already, the managers of the big research labs (Bell Labs, GE, etc.) were very conscious of this. Scientists were not treated as normal employees in these big research labs, but they received a lot of financial support and freedom in research. Often, they could devote 25% of their time to their own projects. Furthermore, these laboratories as well as current day venture capitalists have been aware that research results could not be judged according to the normal standards of efficiency. Less than a quarter of the companies had formal methods to evaluate the scientific output, and even less calculated whether the benefits outweighed the costs. 'You can't keep books on research' was the accepted wisdom in practice.

It should be noted that, historically, 'management' was introduced to increase the productivity of manufacturing, especially at the assembly line. These 'managers' had more insight in the general system of production, and therefore had a higher position in the company's hierarchy. Today, the 'workers' are often much better educated than these managers, especially in the creative industry or at universities. Therefore, it is popular among managers today to say that they 'support' the workers, even if they have kept their lofty positions.[1] Of course, we know that the word 'managing' does not come from 'supporting'; it originally meant the training of a horse and was later used for the controlling of people. This is still what most managers do today and what is meant by 'strong governance': they determine what the workers should do. Much recent implementation of management culture at universities today has been misdirected and has been inspired by this wrong kind of management model.

The literature on management provides us with many different theories in which different management models are discussed, however. Quinn and Rohrbauch describe four different management models, for instance, which are employed for managing different kinds of businesses in which, respectively, control and bureaucracy, human capital, innovation or results, are important. Given that the goal of scientific research corresponds closely to

[1] On the one hand, arguably, it is true that professors and researchers need more support today to deal with large research groups, funding applications and reporting practices. In order to do this, however, they do not need more managers; they rather need more secretaries, administrative assistants and research assistants. On the other hand, management has a knack of creating administration that makes them in the end indispensable as 'support' to the workers to navigate this very administration.

innovation in an entrepreneurial context, Quinn and Rohrbauch's model commends an open systems model with maximal flexibility. The main management styles should be mentoring and innovating, and the focus on monitoring, directing or producing should be minimal. In the situational leadership model of Hersey and Blanchard, an alternative management theory, we find similar results. At a university or a (private or public) research institute, there should be a focus on supportive leadership (motivational, communicative) and there should only be a minimal amount of directive leadership (i.e. minimal hierarchical, controlling, planning and organizing structures). Leadership here does not mean 'strong governance', in which dissenting voices are brushed away, but leadership is meant to motivate and inspire the workers.

Changing perspective: a new model for scientific exchange

Now, one of the speakers in the previous panel has called for looking at the bigger picture instead of the small issues. What I want to do here is to shift the debate to a more basic level of reflection. In particular, I would like to draw attention to the specificity of universities and research institutes, especially in comparison to most companies, which implies that a specific management model is needed.

First, I think what is important here is to see that fundamental scientific knowledge is not a product, and it is not a commodity. For instance, scientific knowledge cannot be consumed like we consume consumables. It is a very curious property of knowledge that the more it is used and circulated the more new knowledge it generates, and the more valuable it becomes. It is a 'non-rival good', and has 'positive externalities', as economists might say. Secondly, a free exchange of ideas is important for creating scientific knowledge. If knowledge is sold at every step as a product or commodity, or if it is checked and measured at every step by accountability and productivity measurements, or if it is kept secret as a trade secret, knowledge stops circulating. As a result, knowledge cannot cross-fertilise, it will hardly be generative of more knowledge, and the trust-relationship between scientists will break down. We can see this happening today before our very eyes. Thirdly, I also think that the value of theoretical scientific knowledge cannot be quantified, and that is what would be needed for a real 'economy' or a market for scientific knowledge.

Instead of a market model for scientific knowledge, Elinor Ostrom, who has already been mentioned yesterday, initiated the idea of the 'knowledge commons', and I think that is a much more interesting idea. For reasons that I cannot explore today, I think that it is not exactly right for scientific knowledge, however. I would propose that academic science actually functions more like what I would call a 'gift economy'. I know that sounds odd. Before people react, I should stress that this is not an idealist idea. It is not about altruism or giving away everything. A gift economy is a technical term for a specific system of exchange that has been studied by anthropologists and sociologists. There are basic social rules that govern a gift economy. Firstly, in gift economies, gifts imply a return gift, even if this is not always made explicit. If an appropriate return gift is not forthcoming, the violator might be excluded from the social system. Secondly, gifts need to be in circulation - and they are often kept in circulation for a long time - to fulfill their function. Someone who hoards gifts and does not give return gifts undermines the proper functioning of the gift economy. A gift economy has nothing to do with good or bad intentions, but it is really about the social structure this kind of exchange constitutes.

At first sight, it seems preposterous to think that gift economies could work in modern capitalist societies. Nevertheless, many aspects of our lives are still structured according to the principles of a gift economy. For instance, donations of blood and organs are usually gifts, and they are not subject to a market pricing that reflects the dynamics of supply and demand.

The volunteer work that goes into the construction of public websites (cf. Wikipedia) and in the creation of open source software most closely resembles an altruistic gift economy of knowledge. Gift giving, in a corporate or other context, is often not gratuitous, however. In a recent study, a sociologist described the gift exchanges between the pharmaceutical industry and physicians, for instance. Although the effects of this gift exchange were monitored through sales numbers, the pharmaceutical companies knew that trying to make a straightforward financial deal with leading physicians would not work and would be counter-productive. Their main technique was to develop trusting relationships through gifts, and to support actions that would increase the prestige of the doctors as well as benefit the company. This example indicates that a gift economy can exist within a broader free market system, that gift economies are most of the time not about altruistic feelings, and that some gift economies are questionable on moral grounds.

I think a gift economy is a fitting description of much of the practice of basic research, in its positive as well as negative aspects. Many aspects that we associate with science are typical for a gift economy. Scientists, for instance, are not paid directly for their work, and we call their articles 'contributions'. As a return gift, they receive recognition and esteem from the scientific community. But the gifts or services rendered by scientists are much more extensive than just writing articles. I just want to give one example here: a Dutch colleague recently proposed to implement a straightforward market rationality on the peer review system for articles and projects. He suggested to be paid the normal market fee for reviewing a project. The problem is that if you calculate the total cost if everyone started doing this, it becomes clear that the whole system would break down.

Most kinds of funding too has (or used to have) a gift structure. Especially in the American system, accumulated donations by rich alumni constitute a large portion of the wealth of a university. Also government funding can be interpreted as gifts. When the government hands the funds to universities and funding bodies, it used to be a general funding package for scientific research with only few attempts to influence the topic and course of the research. The more the government intermingles, and the more direct 'results' they expect, the more this kind of funding would loose its gift character, however. Also at the level of the individual scientist, when she receives her funding, there are (or were) often no strings attached. I mean that she keeps the freedom to direct her research in the direction she deems best. What is important is to see that funding scientific research is not a market exchange: a funding body does not 'commission' or 'buy' a specific piece of knowledge, and a scientists who does not deliver the 'expected goods' is not expected to 'repay' the grant.

Science is a high risk investment, with potential huge rewards, for which the standard accountability measures from the management industry do not fit. It should be stressed that a gift does not contradict the idea of competition, or the importance of qualifications of the recipient. One does not give gifts to just anybody. In most societies, gift giving is a very codified exchange, in which the receiver has very specific credentials (varying from family relationships with the giver to extensive scientific credentials). Furthermore, if funding is a 'gift', the scientist is of course expected to give an appropriate 'return gift', otherwise, she will loose her position as a scientist (she will be excluded from the sciences' social structure). But again, this 'return gift' is not a product: because of the radical uncertainty that determines real scientific practice, the results cannot be expected and 'commissioned'. A funding body can only decide to fund promising proposals and hypotheses.

The gift remains in some way a part of the giver, there is not the alienation between the worker and the product. This holds for the scientist too: her discoveries often bear her name, and remain linked to her persona and constitute her fame. The circulation of ideas, the communication between scientists, also functions as gifts that circulate. These gifts create the social fabric of science; they create the trust, the community of scientists and the identity of a

scientist that we find so important. It reinforces the shared values of the group, the values of being a scientist. These norms are internalized and reinforced by gift exchanges.
Before I conclude, I should stress again that the gift economy does not have just positive aspects. There are also negative ones. I have spoken of questionable relationships between the pharmaceutical industry and physicians. In the university too, the tight socialization of a gift economy can be suffocating. The gift economy can also lead to a patronage system that hampers meritocracy. For instance, in the old university model, research assistants got preference, so to speak, because of their services to their superiors, not because they were the best researchers. I think this is because in this case, the gift idea is implemented on too narrow a scale. I mean, your scientific work should not be directed to your professors or your superiors, it should be directed to the scientific community.

Managing the gift

Management should take the gift character - both its positive or negative aspects - of scientific knowledge exchange into account. So, just to give one example of how this might be applied to science policy in the case of evaluation. Although evaluation should not be executed on a local level (within a department, for instance), which would favour a patronage system, it should also not happen by just counting output, I think. A mixed committee of peers, on a medium scale, so that these peers can actually be knowledgeable about the work that is evaluated, would be the best solution. This mixed committee, with changing membership, is the closest representation we can get of the scientific community as a whole. If we see scientific research as a gift, the fact that such a committee has to evaluate a scientist's work would mean that this representation of the scientific community has to deem the scientist's gift acceptable. Such a procedure sends a clear message to the scientist that she has to direct her gift (her research) to the scientific community and society as a whole, not to one patron or head of department in order to please them.
Of course, such intensive evaluations take a lot of energy and time. To make this possible, one should not make empty evaluations all the time by counting the output of researchers. In any case, just counting output misses the informal exchanges between scientists, their reputations, the reputation they have among peers; it misidentifies the real value of their work and in general it ignores the gift character that constitutes a central part of scientific work. Instead, one should make good and informed evaluations only at crucial moments in a researcher's career. As long as gift exchange is still important in the scientific society, people will know and will be able to estimate the value of their colleague's work, and more external controls and measures will be unnecessary. Furthermore, a scientist who is well socialised by means of this gift network between colleagues will not need 'objective measures' to be motivated, and the performance of the group will increase the more socialised its members are and the more a free exchange of knowledge-gifts can take place.
I think the idea of a gift economy is also a start of an answer to the question of trust that has been posed during previous sessions. The trend of total surveillance - as has been said yesterday - came into existence because of distrust, but I think the process also works the other way around: imposing more surveillance itself creates more and more distrust. We arrive in a loop of distrust, a kind of infinite regress. I think this can happen because the gift economy of science, and the social structures that come with it, are breaking down today. Scientific practice is changed into what might be called a market system by installing an accountant attitude to values like efficiency and productivity. But gifts cannot be measured, or at least, it is inappropriate to measure a gift. Similarly, it is not possible to isolate and measure the quality, let alone the financial value, of a piece of fundamental scientific knowledge. Therefore, efficiency and productivity measurements make little sense in the case of science.

In contrast, it is the gift relation between scientists (and between scientists and society) - the moral and intellectual commitment to advance this radically uncertain activity which is called science - that installs the trust and the social cohesion that also leads to the credibility of the scientist. All this disappears if knowledge becomes just an accounting procedure, a market transaction or merchandise.

Indeed, a gift economy is particularly effective for social systems in which well socialized persons operate independently of controls. This is because the gift exchanges and the social reciprocity involved reinforce the internalization of the norms that govern and characterize the system. This is also the case for academic research, and a scholarly gift economy will produce researchers that are strongly committed to the values of academic science as well as to the scientific community. This has important implications for managing fundamental scientific research. Fostering what I call a 'gift economy' among scientists might restore the badly needed trust in the scientific community as well as the ties between science and society. These insights tie in nicely with recent management theories which suggest the importance of supportive leadership for scientists. Specific tools for fostering 'gift exchange' in science (as opposed to market and accounting models) and for minimizing the negative effects of a gift economy should be developed as part of concrete management models for fundamental research. Instead of a directive, controlling and hierarchical structure, a motivational and communicative approach will be central to such management.