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COMPLEXITY WORKSHOP
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The Rolls Royce Marine Project

EVE MITLETON-KELLY, Director, Complexity Research Programme, London School of Economics.

Introduction

Different qualitative and quantitative tools provide rigour in understanding an organization by triangulating the data and testing the findings against the conceptual framework of complexity theory. The Rolls Royce project is an interesting case history where post-merger integration posed a particular problem and the solution depended upon an in-depth analysis of social interdependencies. Different, but complementary information about the organisation offered a deep understanding of real problems. This was used as an informed basis for creating an enabling infrastructure, based on social, cultural and technical conditions that facilitated the emergence of new ways of organizing working practice.

Background

We always start with the perceived practical problems of an organisation and in this case it was a rather serious lack of integration two years after an acquisition. Rolls-Royce is primarily in the aerospace sector, but also has a naval marine sector which they wanted to expand into the commercial marine sector. They acquired a number of small companies in Sweden, Norway and Finland, which were family firms that had already gone through a series of mergers and acquisitions before Rolls-Royce acquired them in 1999.

Rolls-Royce, in both the aerospace and naval marine market, had previously dealt with a few, very large customers, but the acquisition brought in 2000 new customers and hundreds of products with very fast lead times. In the aerospace sector, for example, there is normally a time horizon of 20 years, but in commercial marine it can be a week, so we can imagine the difference both in the business culture and in ways of working. Rolls-Royce also had a matrix organisational structure that was very different from the smaller companies. Two years after the acquisition there were still a lot of issues in terms of integration. The problems were perceived as stemming from different national business cultures, so two years after the acquisition they had a conference to

identify some of the key issues. They identified two things; one was that they needed to clarify roles and responsibilities and the other was to improve cultural awareness. In fact, what they identified were really surface problems. When the complexity team looked deeper into the issues they demonstrated that in many ways diversity between the different national cultures was not a problem, but a strength to be built upon. What was needed however was an understanding of how the overall coherence of the organisation could accommodate diversity.

Working together

The approach that we use is called 'collaborative action research' and we worked very closely with our partners in Rolls Royce. We did not just observe them, as researchers or consultants tend to do, but engaged very closely in a reciprocal interaction in which we were affected by them as much as they were by us. Complexity thinking involves the idea of co-creation. It implies that you can no longer work effectively by simply imposing control from top management. It also becomes necessary to create an enabling environment in which all aspects of the organization can be considered. You cannot simply isolate one aspect; if you are looking at the technology, for example, you need to site it within the cultural and social environment. Looking at an organisation as a complex system means looking at all the different aspects that make it up; the social, cultural, technical and physical environments along with the political and the economic. All these co-evolve and the object of the research is to find out how they are interacting with each other. That is fundamental to our thinking and methodology and something that we have been developing and testing over the past 10 years.

Case history

The Rolls-Royce project is interesting because we were given the opportunity to invite some of 'accelerated leadership development team' (ALDT) as the future leaders of Rolls-Royce to volunteer to become researchers. We had 16 volunteers and we were able to make up four teams consisting of three from Rolls-Royce and one from the LSE to carry out in-depth interviews. This enabled us to interview people in the three Nordic countries as well as the UK and the USA - something that a small team would not have had the ability to do. It enabled us to understand the organization, and the part that the new business played, better than we otherwise would have done and gave the Rolls Royce teams not only a deep understanding, but a large number of practical tools to deal with the situation.

Methodology

I will go very quickly through the methodology because I want to focus on the complexity at the end. A project starts with in-depth interviews and something called LOM which stands for 'landscape of the mind'. This is a psychological test which enables us to assess individual and team personality profiles, though individual profiles are not made explicit. We also use Netmap, which is similar

to the research that Bernardo Huberman has described, and looks at e-mail connectivity. Like Bernardo's method the actual content of an e-mail is not examined, but the fact that it has been exchanged. Agent-based computer models and simulations are also used, together with visual representations using an artist to illustrate issues or problems. We took all the four teams through a two-day facilitation workshop which brought to the surface very deep issues that were not being discussed. One of the key findings was that the problem with the different national cultures was being used as a smokescreen. It tended to be given as the reason why anything went wrong and prevented penetration of the real problems. As a result of this deep understanding by the ALDT team and the LSE researchers we were able to put recommendations to the board which they accepted and put in place twelve work streams to implement them.

LOM is an analysis of preferences that can act as potential enablers or inhibitors in effective decision-making, strategic thinking and knowledge dissemination. This high level of analysis can then break down into several levels for different aspects of the working practice. What was reassuring was that all 70 top managers in the Nordic countries and the UK agreed to the test as an e-mail questionnaire and what was quite astonishing was that the findings showed that there was no significant difference in the preference profiles between the Nordic managers and the UK ones. We had reached that conclusion already from the initial interviews, but Rolls Royce wanted evidence in the form of hard facts and figures. Once they saw the results it was a turning point that enabled us to convince them that cultural differences were not really the problem, but it also raised other aspects that could be worked on.

The agent-based models and simulations were also built on and validated by questionnaires, including epidemiological analysis of how ideas spread through a population like a virus infection. Using Netmap we were able identify 'linchpins' (key managers, organizers and disseminators of information) and the networks where innovation and decision-making was taking place. These are the 'informal networks of communication' that Bernardo has mentioned and we were able to use them for 'what if' scenarios. A key benefit of this kind of analysis is it enables help and support to be given to the different networks discovered in the transfer the learning, but importantly discovers previously hidden emergent and tacit knowledge flow.

I want to say something about how we work with an artist. A picture can hold or illustrate a multiplicity of issues in one format, but what is of particular interest is the ability to present the very sensitive challenges that are difficult to talk about. For example, in the past we worked with an organization (not Rolls Royce) which was totally dysfunctional and in danger of falling apart. In an attempt to improve the situation the management was giving one initiative after the other which staff had to implement. It made life extremely difficult for

managers, failed to address the really deep issues, and was represented by the artist as plates being spun on the top of sticks. The painting was put up on the wall to reflect an exceedingly painful and sensitive problem at a 'reflect back' workshop. Initially there was a puzzled or perhaps icy silence, until recognition dawned and someone laughed which proved to be an icebreaker which enabled the problem to be brought out into the open. Had we started talking about the problem straight away people would have become very defensive and we would not have been able to have the open discussion that followed.

The problem

Rolls Royce had acquired the Nordic firms because they were the best in their field and were responsive and flexible in their business transactions. Management wanted to expand the company's market profile by adding commercial marine business to naval marine business. The small companies knew their customers very well and their managing directors were constantly on the phone. If a customer rang on Monday to say that he wanted a particular modification to the product by Friday that could be done. Rolls Royce was different - they came from an aerospace and naval background and that imposed procedures that were cumbersome and which slowed the whole process down. Imagine the frustration of a customer who rang up, to find that, first of all he didn't get through to a single person, but a whole string of them and that when he did finally manage to explain what he wanted he was told that the final decision rested with the head office in Derby. Rolls Royce had acquired the companies because they were flexible and innovative of new products, but were unwittingly undermining the advantage. They wanted to open up a space of possibilities, but were working in a way that was having the opposite effect. The cumbersome matrix structure and the bureaucracy seriously inhibited new product development, innovation of working practices and responsiveness to customers.

Interviewing some of the Nordic managing directors was very uncomfortable because they were angry and frustrated. People in the UK were saying that they did not understand them and they did not even understand each other. That was the perception from the UK. Whereas the perception from the Nordic countries was that Rolls-Royce wanted to obliterate their identity and impose their unworkable procedures and practices on them. With that kind of negative perception on both sides it was very difficult for there to be a dialogue for integration. Instead of putting energy into exploring new possibilities and new markets, there was a defensive closing down which constrained any self organization and emergent beneficial innovation.

The solution

Using the different methods described above we reached an understanding of the social, technical and political aspects of the organization. For Rolls Royce the

acquisition had pushed the organisation far from a state of equilibrium where established norms and established ways of thinking were no longer applicable and new ways of working had to be created. An effective and successful merger of an acquisition does not involve the imposition of the culture of the dominant partner. It involves the creation of something new, rather like the birth of a child; both parents contribute to its being, but it has its own identity. We therefore constantly looked at the connectivity within the organization until the interdependence was finally appreciated from both sides. Following a conference, information feedback processes were improved and people opened up to influencing each other in a much more positive way and changing their viewpoints. The myth that national cultural diversity was the problem was dispelled. The weight of history was thus becoming less on both sides and something new was being created. Rolls-Royce Marine has now grown by 30% in the four years since the project was started.

Complexity thinking

I have listed below some of the generic characteristics of complex systems. There are 10 of them on the right of the diagram backed by complexity science theory on the left. The list is not exhaustive, but they are the characteristics that we wanted to work with.

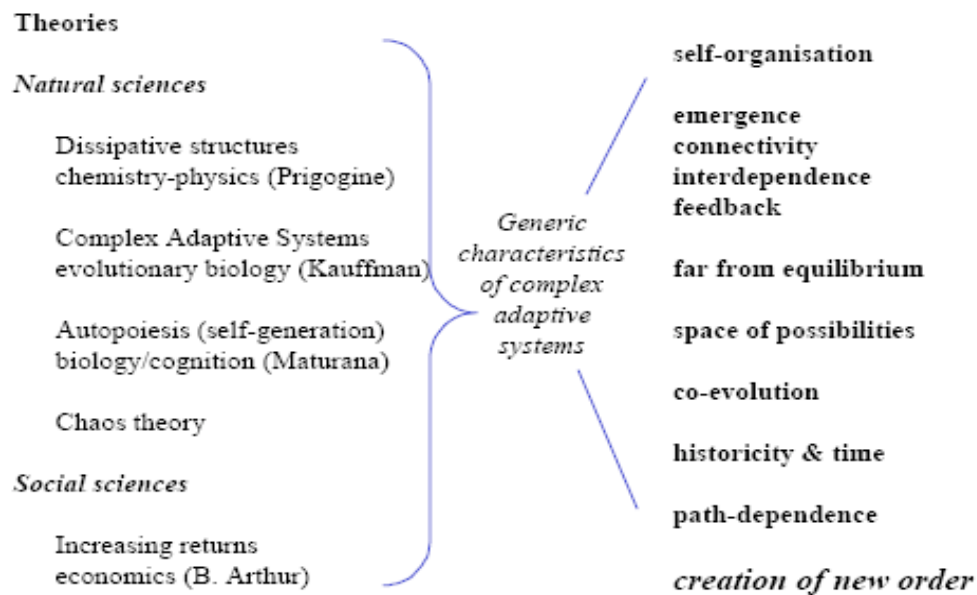


Figure 1

Human social or business organisations are complex systems in their own right. This means that terms taken from the natural sciences are not just analogies or metaphors, but accurately describe the characteristics of the systems. So for the past ten years of our research we have been asking which of these characteristics

apply to the particular organisations under study. This is a constant test. The four characteristics that are grouped together (emergence, connectivity, interdependence and feedback) are terms that have already been used in Systems Theory, but the others are not always articulated in a social organization. There are several other interpretations coming from the different scientific disciplines, but these are the key distinguishing characteristics of complex systems in the way we interpret them. Through these characteristics a complex system has the capacity to create new order, whereas a mechanistic system does not have that capacity. Many technical systems are complicated, but not complex, but they become so the moment they interface with a human being.

The ten characteristics of complex systems are patterns against which particular organisations can be compared.

- Any complex evolving system has emerging new structures and ways of working.
- We cannot stop emergence, but we can constrain it so that it does not result in chaos and we can facilitate its acceleration when it is beneficial.
- We can encourage self-organisation and exploration of the space of possibilities, but that means we cannot have a blame culture. The exploration of new ideas is always risky. You may have to explore ten ideas to find one good one, but exploration of the whole ten is always necessary.
- The right enabling environment is important.
- Relationships are important and what complexity does is shift the emphasis from object to relationships and a collaborative culture.
- Diversity is important and it needs to be able to cope in an unpredictable environment. An insight in Rolls-Royce was that the organisational structure needed to be less organised and diverse, but not too random. It required a 'fuzzy matrix' which gave an enabling infrastructure which facilitated the new working relationships and the creation of new knowledge.

Discussion

Questioner 1. I liked the engagement you had with Rolls-Royce Marine, but if I can be provocative, there are organisational books that tell you how to do this kind of exercise without borrowing the language of physics. So what is different here? You talk about 'self-organisation' and so on, but what is it that these words, borrowed from very strict disciplines, do for this. You talk about 'complexity thinking'. What is 'complexity thinking'? Some organisations do it all the time and people do it without having to resort to such scientific language.

Eve. What we find from our research from over a decade is that if organisations

start understanding some of the characteristics of their organisations as complex social systems, they understand the possibilities. That is why I emphasised at the beginning that we try to make a substantial shift so that we do not just use the language that comes from physics or biology as a metaphor or an analogy, but understand how it makes sense within an organisational context.

Questioner 1. So how do you use it other than as a metaphor?

Eve. If, for example, we were to facilitate 'self-organisation' the term has quite a specific meaning in a particular context. We are very familiar with the notion of self-management, but it is useful to distinguish it from a spontaneous coming together of a group of people to do something without outside direction.

Questioner 1. But organisations have been doing this for a very long time without reading a single page on 'self-organisation' as a complexity science term.

Eve. Yes, but without a conscious understanding of it, organisations often tend to stop it happening.

Questioner 1. How does learning from complexity papers start them doing it?

Eve. Well, it does have a very significant influence. Trying to think in those terms tends to change the perception. That is why we put so much emphasis into what we call 'complexity thinking'. It can change the perception quite dramatically. We have seen organisations change their entire culture, their structure and their ways of working once they start living with the principles, and the terms have a very specific meaning in an organisational context.

Questioner 1. But the courses that we teach at Stamford, for example, are all about that.

Eve. They are, but I think that when this way of thinking is underpinned by theory it gives a great deal more confidence and power to managers. A good manager may do all of these things intuitively, but when they have the language, the concepts and the theory they move from working in the dark to being able to see where they are going much more clearly.

