

COMPLEX ORGANISATION PERSPECTIVES

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Abstract. There is no specific definition for ‘complex’ although many organisations are defined as such. Many academics and business authors provide ideas and methods on how to deal with large, complex organisations (LCO) but none provide definitions. This paper proposes a definition of a large, complex organisation which can then be used as a mapping tool to assist organisations to select appropriate communication methods when sharing management information between Information Technology (IT) business projects.

1. Introduction.

There is no specific definition for ‘complex’ although many organisations are defined as such. Many academics and business authors provide ideas and methods on how to deal with large, complex organisations (LCO) but none provide definitions. This paper proposes a definition of a large, complex organisation and highlights the problems being experienced with the existing business structure.

Design/methodology/approach – To conduct an analysis and review of what is meant by a large and complex organisation. To provide a summary of the type of business structure in use in large and complex organisation.

To use a case study to map out the definition of a large complex organisation to test out the definition criteria.

Research limitations/implications – The analysis is limited to hierarchical organisational business structures using research conducted from the 1900s to the present day. Complex organisations tend to use hierarchical business structures rather than for instance, matrix business structures. The case study chosen for this research is

the National Health Service (NHS) in the United Kingdom (UK) because it:

- Is the third largest employer in the world so satisfying the term ‘large’ in this paper and the largest employer in Europe (Talbot-Smith and Pollock, 2006, p147),
- It is multi-layered working with hospitals, clinics, doctors and private health practitioners based across all areas of the UK (Talbot-Smith and Pollock, 2006, p36-47)
- The NHS is in transition where the pace of the transition is rapid and change is far reaching (Talbot-Smith and Pollock, 2006, p1)
- It has a multi-layered set of managers who direct the management of the day-to-day duties of the services provided
- It has outsourced many facilities including the Efficiency and Quality elements ensuring services are provided to a specified standard (Talbot-Smith and Pollock, 2006, p104-135)
- It uses Prince2 in managing its many projects which has the lessons learned element as part of all projects official closedown
- Projects are created for many groups, individuals and hospitals (Talbot-Smith and Pollock, 2006, p36-47)

It has work commitments with many outside contractors such as NHS dentists, Community Health Contractors, joint ventures with the private sector and overseas European Union member states. Historically large and complex organisations use hierarchical business structures to organise their businesses. In doing so the idea is to reduce the amount of work required from individuals to a manageable level. The idea behind hierarchical structures is that every entity in the organisation reports to a single entity apart from the head of the organisation (Zhao, R, 2007). Many of the journal papers concerning hierarchies outline how out of date these structures are but they continue to be used. Leavitt (2003, p96) confirms that hierarchies are still a very basic structure of ‘most, if not all large, ongoing human organizations’. He believes they are adaptive systems and deliver ‘real practical and psychological value and fulfil our deep need for order and security’. It seems people generally need the type of authoritarianism hierarchies provide.

2. Literature review of current complex organisational definitions.

2.1 Businesses views on large, complex organisations

The term ‘large’ is based on the number of employees and the budget available. The NHS case study can be described as large because

- it is the third largest employer in the world, employing 2% of the people of working age in the UK (Lister, 2004)
- employs, as of June 2010, 1,606,000 people (Great Britain. Office for National Statistics, 2010),

- has a budget of £48 billion in the year 2008-2009
(http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_111591).
- Oxford Dictionary definition for ‘large’ considerable or relatively great size, extent, or capacity (2008)

The concept of complex when describing an organisation is qualitative rather than quantitative (Backlund, 2002). There is no overall definition for complex organisation. Academic and business papers and books have been reviewed in order to arrive at a consensus.

The Oxford dictionary (2008) gives the following definition for complex consisting of many different and connected parts and not easy to analyse or understand; complicated or intricate: a group or system of different things that are linked in a close or complicated way; a network:

KPMG (Thomas, 2008) conducted a survey amongst companies across the world and has, in collaboration with the Cardiff Business School, developed a business model incorporating four areas of complexity:

- governance complexity
- customer complexity
- inbound supply complexity
- operations and distribution complexity

To support this model the organisation to

- deploy a coherent vision
- balance the supply chain
- manage talent
- accelerate design and innovation
- execute change rapidly.

KPMG advocate all themes are implemented together through integration of all the processes and departments within an organisation. The general overview is that separation of tasks into departments each working independently is out of date.

Instead of simplifying the tasks they are increasing complexity in an organisation by the act of separation itself. In order to satisfy customer requirements integration of linked processes within the organisation is vital. In working towards this model understanding of the business and how to deliver a product is vital.

Kaufman (2008) discusses how the rate of change in business is compounding business complexity by the acceleration of change, reduction of project life cycles, increased competition, demands for information, higher quality of products produced and the need for organisations to find new ways of managing.

Both the authors in this section are highlighting the need to involve all employees in the business decision making process and that external factors are creating a real need for changed ways to manage the business process and satisfy customer requirements. Managers cannot control everything as they did in previous management structures such as the hierarchical model. Business functions can no longer be broken down into neat, separate departments. The thread linking customer satisfaction and revised business requirements is too closely aligned to the supply chain, strategy and quality issues within the business.

2.2 Views from academics on the meaning of complexity

Goold et al (2002) discuss the organisation of control between corporate parent and operating units in complex and interdependent corporate structures which have overlapping and sharing of responsibilities. They state that the 'role of the corporate parent has become more complex as companies evolve into interdependent corporate structures'. The

interdependent structures are complex in terms of relationships between operating units and between parent and operating units. There are multiple relationships between and within operating units and the corporate parent with one operating unit reporting and having responsibilities to more than one manager. Parent can also have intermediate parents, i.e. groups, divisions, reporting to corporate headquarters.

Backlund (2002) cites Yates' opinion complexity arises

- whenever significant interactions take place
- high number of parts/degrees of freedom/interactions exist
- nonlinearity
- broken symmetry
- nonholonomic constraint

He also cites van Gigch 'given the difficulty of finding a unique, all-encompassing definition of complexity, we must resort to an *ad hoc* case by case approach that depends on the problem at hand'.

Southon et al (1999, p30) discuss 'a large, complex loosely structured organisation which has a strong professional influence'. The organisation in question is a health authority. The managers of the independent units are doctors and are independent of the parent organisation and are managed as 'autonomous professionals' whereas administrative support staff are organised 'more bureaucratically' (1999, p37). The independent units function differently from each other and are only loosely connected but the IT system proposed is intended to be used in all the units and for all units to operate in the same way. Thus the organisation has multiple stakeholders, with complex organisational arrangements with a central proposal to use an identical IT system.

Waring et al (2002) highlights the NHS which is described as complex. It defines the

organisation as having national and local structures with diversity of stakeholders, working in a complex political environment

- demographics and the effects on the proposed IT system

Waring argues the need for the NHS organisations to be recognised as complex systems environment and to use 'relevant theory when...introducing integrated systems'.

Mileti et al (1977, p209) cites Hall that 'there is general agreement large organisations tend to be more structurally complex'.

Richardson (2008) defines the difference between complicated and complex. A complicated organisation within a business environment would mean that an overall theory of business would exist making management 'very easy indeed...'. Any problems which occurred could be solved using an all encompassing business theory book. His definition of complex system is '...such systems are made up of a large number of non-linear interacting parts... with non-linear feedback' (Richardson, 2008, p14). The consequences of what he is saying however, is that to make use of the feedback, employees need to have the authority to determine outcomes without the need to ref back to their supervisor.

Richardson (2008) believes knowledge of a complex system exists but it is approximate and provisional. His paper provide strategies for managing complex organisations but the definition of complex is not defined explicitly. He discusses a system in terms of a complex adaptive system (CAS) where the individual parts are also complex systems. The parts of CAS have local memories, series of detailed responses to same and different scenarios, have the ability to learn from their own experiences and are able to generate new responses using the learned experiences. They are able to make local

decisions and learn from their local experiences. An example of this is a local administration section within a Hospital. Take the registration of a patient to see a specialist. Ideally to reduce the complexity of this process, one individual could book the appointment with a consultant and monitor the patient throughout their consultation with follow-up and any necessary treatment. The process of the patient working through this process could be regarded as a 'project' with the administration person monitoring all activities for the patient including appointment, follow-up visits, any other prescribed treatment. Instead the patient is given a choice of hospital for the consultation by the general practitioner (GP), appointment booking is the responsibility of the selected hospital, results of the consultation are sent to the GP. If the results of the tests are negative more tests have to be sanctioned and the process needs to start again. Complexity is then introduced at all stages of the patient experience. Communication links are multiplied during these processes when perhaps three links need to exist, one between patient and GP and one between patient and Consultant and one between Consultant and GP.

Richardson's theories promote a pluralistic theory of management and away from a 'monism' view of management. Whereas when it comes to designing and building IT systems or managing organisations a 'monism' view of management decision making is invariably built into these systems. Most systems do not have in-built multiple answers to a problem with the same inputs. Business processes tend to have inputs, a process and then an output where the business rules invariably generate the same output for the same scenario. To build a process where this does not happen is rare and requires the use of artificial intelligence.

Employees within an organisation often do not have the control to interpret different outputs to the tasks they are performing.

Vesterby (2008, p90) speaks of understanding as ‘the proper tool for dealing with complexity’ rather than trying to simplify tasks. Quantity and diversity of components and relations are a way of defining diversity. Using the University example of administration and student experiences, understanding what is wanted for the student to graduate and designing systems from there with the minimum number of interactions but a deeper understanding of what is wanted is actually what is required. Vesterby then specifies six qualities of complexity namely number of components, how many different types of components, the number of each type of component, the number of relations, how many different types of components and the number of each type of component.

He cites Crawley’s complexity measures which focus on the relational aspects of the complexity such as the number of interconnections and their types, the sophistication of the interconnections and the sensitivity and robustness of the connections.

3. Proposed definition of large complex organisations (LCO).

Summarising the authors views and comments, complexity in an organisation can be summarised as:

- large number of components within the organisation communicating with each other
- different types of components such as parent and subunits within an organisation
- there are many relationship and interactions between the components

- the different types of relationships and the interaction between the relationships
- the need to understand in depth the business functions within an organisation
- the requirement for non-linear feedback within communication pathways
- there may be more than one output or result for one input
- arrangements of components and/or subsystems not symmetric
- organisational behaviour is complex
- complex external interactions exist
- control by one manager increases complexity
- hierarchies in the business structure increase complexity

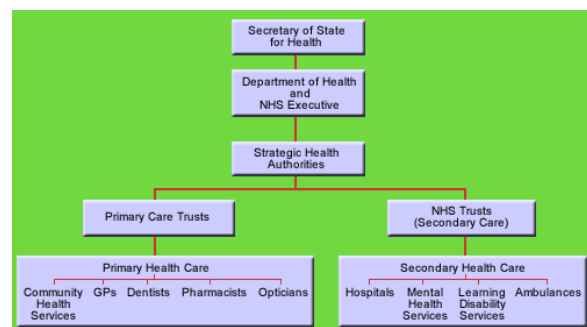


Fig1

Taken from http://www.ohe.org/page/knowledge/schools/hc_in_uk/nhs_structure.cfm 14/10/2010

The NHS has several layers of management as highlighted above, each having their own specific responsibilities.

The Secretary of State is the equivalent of the CEO. This position has overall responsibility for the NHS with operational responsibilities divided between the lower levels. The NHS is known for the rapid rate of change. From 2012-2013 the structure is intended to change to the following structure, fig 2.

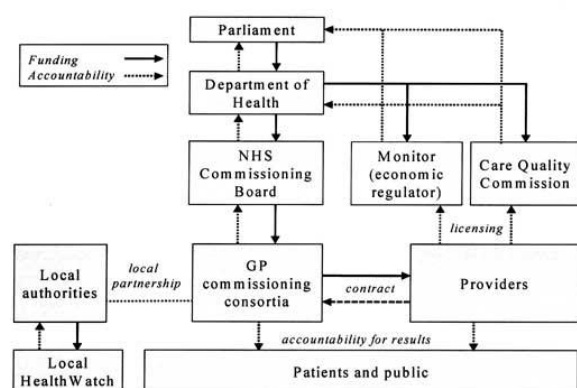


Fig 2

Taken from [http://www.nhshistory.net/a_guide_to_the_nhs.htm#How the NHS Works](http://www.nhshistory.net/a_guide_to_the_nhs.htm#How_the_NHS_Works) 14/10/2010

Both structures highlights the many levels of organisation decisions and communications pass through.

In their book on the NHS Talbot-Smith and Pollock (2006) provide overviews of the NHS structure as follows. Strategic responsibility resides with the Department of Health. There are twenty eight Strategic Health Authorities (SHA) who supervise NHS trusts with operational responsibility of the NHS in their own areas. In addition they have strategic responsibility for local development of services.

The NHS structure has numerous external links such as the NHS Purchasing and Supply Agency, National Programme for Information Technology, Special Health Authorities, the NHS Institute for Learning Skills and Innovation, The Business Services Authority, The NHS Litigation Authority, The Health Protection Agency and many other agencies.

The NHS therefore can be considered complex in the interactions between the internal and external links.

The relationships between these links also have different types. Some of the relationships are strategic, some operational and some passing of information to ensure people are informed.

4. Business structures.

4.1 Mechanistic and Organic structures

Burns and Stalker (1994) theory on mechanistic and organic business systems defines business structures in a simple and understandable format.

Mechanistic structures are appropriate when conditions within the working environment are stable, tasks are fairly specialised, control is hierarchical, communication is vertical and control resides with the supervisor. Whereas organic structures can be seemingly the exact opposite. Tasks are less focused and can cover many areas of expertise, the working environment is constantly changing, team working is required with less need for a supervisor, communication and control needs to be spread amongst the team rather than retained by one individual.

Complex organisations appear to have the characteristics of a mechanistic organisation. The case study of the NHS certainly has a hierarchy as highlighted in the introduction. Hierarchical structures are intended to improve productivity and efficiency (Mullen, p43). They have been in existence for hundreds of years and are suitable for environments where change is slow and conditions in the external and internal work environments are stable (Krebs, 2008). Workers are organised in departments managed by a manager with clearly defined business functions and boundaries (Mullins, 2008). They generally use scientific and/or bureaucratic business structures. Demange (2004) defines a hierarchy structure as a pyramid network, with a single person in charge at the highest level, limiting communication between department and/or people and having a precise set of authority.

4.2 Communications in hierarchies

In hierarchical organisations communication flows vertically between supervisor and subordinate very much a linear process (Windahl et al, 2009), (Burns and Stalker, 1994). Requests are passed upwards from subordinates and downwards from supervisors.

Complex structures have increased the communication flow within the organisation as the tasks are broken down to provide smaller tasks for employees. The view that employees work on a task and then wait to be given another by their supervisor is endemic in a hierarchical structure.

One option to reduce communication links within the LCO is to move to an organic way of working on the task. That is, the employee performs several previously devolved tasks with the authority to make decisions in their working environment. In order to do this the employee requires access to the communication and communication media previously reserved for supervisors.

4.3 Possible uses and Implications of the Complex Organisation Framework for IT Business Projects

IT business projects involve knowledge workers whose general working environment is organic (Reigle, 2001). The mechanistic way of working is diametrically opposite to organic. Organic environments place little emphasis on change on command, have lateral communication links, employees commitment is to the organisation's tasks, they look for better ways of working rather than remaining with existing work practices and importantly employees need little direction and need to be allowed to get on with the job.

The implication of this is that when working in a mechanistic organisation such as the

NHS the rules for working need to be defined and made known to the knowledge workers working in the IT business projects. Using the knowledge that mechanistic organisations work in hierarchies may influence the IT system developed and could alter the approach taken to stakeholders selected for involvement in the project. Prince2 is capable of working in either a mechanistic or organic environment and this is the PM method required for Government projects.

5. Conclusions.

This paper has reviewed large complex organisations and the organisational structure which generally supports such organisations.

The reduction in the communication links between the departments and individuals in such an organisation, point to moving from a hierarchical structure to a more organic structure where the worker is given more authority to see a task through from start to completion. The difficulty is in where the start or finish of a task is. Vesterby (2008) says understanding complexity is a vital task and to do that the worker needs to understand what is expected from them and the tasks they are meant to achieve. In the example used in this review the aim of the patient is to resolve their health problems. The processes needed to achieve this within the NHS need to reflect that main aim. The proposal is to provide a team consisting of both medical and administration staff, who welcome the patient into the NHS and who will then be responsible for ensuring the patient progress through to the end of the proposed diagnostic and treatment programme. The idea is to see the experience as a project with a beginning, a middle and an end.

What seems to be omitted in many of the papers reviewed is how much control can an individual accept or be given before there is loss of ability for an organisation to function and produce what customers need. This could be an area for further research.

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