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POWER AND THE PURPOSE OF INFORMATION SYSTEMS: LESSONS FROM LOST CIVILISATIONS

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Abstract

This paper argues that a prime focus of information systems should be on power and politics and that this remains a neglected field of study. Using examples from four historical civilisations, two Sumerian city states, the Hittite empire and the Inca empire, the role of information systems in maintaining power structures is illustrated and it is argued that this is their primary purpose, an argument which is pursued with reference to the theory of public choice. The paper concludes by illustrating the power motives in the development of social computing and calling for the application of political theory to information systems studies.

Keywords: Power, Politics, Theory of Public Choice, Ancient Civilisations

1.0 Introduction

The purpose of an information system and its role in an organisation is often difficult to determine and should be a strong focus of information systems research. Understanding of information systems and their role in organisations and society has been focussed on the technology and the organisational structure within which the information system resides. A refocusing is needed on the policies and politics of the organisation and how they affect information system deployment.

Why an information system is implemented and how it benefits a whole range of users, including employees and customers is a source of mystery. The benefits of information systems, couched in cost benefit analysis statements, give little idea of what the real purpose of the IS is. Indeed, for many information systems, the benefits are not pursued, and no post-implementation evaluation is conducted. The process of IS justification is often ritualistic and couched in objective terms which obscure any understanding of the real purpose of the IS implementation. The real purpose of the IS lies beyond the rhetoric of efficiency, even if improvements of productivity do result.

It may be that the drivers of IS implementation and the forces within the organisation which result in the growth of IS are rather political, driven by the self-interest of individuals, played

out in political groups. Hence in pursuing an understanding of organisational IS and as will be discussed later in this paper an engagement with politics is required. Questions such as Why do IS fail?; What are the success factors in an IS implementation such as an ERP?; What drives IS adoption and usage? What are factors behind the spread of social computing? may have their answers in political studies rather than the study of the interaction of technology and individuals or organisations pursued in, for example, socio-materiality. Indeed a focus on organisations and users may overlook the real players in IS implementation and usage; these are the leaders and politicians, pursuing self-interest in the context of the board of directors, the shareholder voting groups, unions, regulatory bodies, employee communities and groupings, and customer lobby groups.

With in such an environment where the behaviour of an IS is really politically driven, the ideas of the technology adoption model, for example, that IS usage is driven by perceived ease of use and perceived usefulness, and theories such as the theory of reasoned action, are irrelevant. The ideas of coercion in institutional theory and the translation of interests in actor network theory have more relevance. Even so it is contingent on information systems researchers to pursue political avenues such as the theory of public choice (Butler,2012) and to understand the entanglement of the technology and process of IS with the Machiavellian politics of public and private organisations.

Managers and leaders do not make logical and rational decisions enlightened by scientific objectivity and a rational evaluation of choices in the selection and implementation of IS. Rather conflicting self-interests produce choices that emerge from the milieu of conflicting power forces and environmental forces.

Markus (1983), in her seminal paper, identified the role of politics in IS implementation and discussed Interaction of the system with distribution of intra-organisational power. Hence theories of resistance to IS are political theories which reference power. The power that determines the role of IS in organisations is strategic and contingent (Silva, 2005). As an example, a study of a Taiwanese port authority revealed the role of power manipulation in information system deployment (Chang, 2010). Information systems may be exposed as power instruments when they elicit a clash with existing power structures which gives rises to resistance. For example, the implementation of an electronic prescription system fails when it undermines the power of professional groups of physicians (Joia and Magalhaes, 2009). IS may be better viewed as instruments for wielding political power. The ideas of the theory of public choice which applies economic concepts of opportunity of cost, benefit to the politician, profit and lost to the politics of government and the democratic process, may apply to the study of IS in organisations.

Critical questions are: Whose interests are served by the information system ? and What is the purpose of IS in serving those interests?

However, the answer to such questions can be subject to the distraction of the structure and form of the technology, the interfaces and the relation to the business processes. The focus on the technology may lead to an emphasis on user interface failures, training, alignment to business processes, and the methodology of development such as extreme programming. Thus rather than a need to increase the IS focus on technology, approaches which set aside the technology and examine the relation of the IS to political powers are needed.

One approach is by examine information systems in history where the importance of the technological artefact is minimised, By stripping away the technology, the focus on the purpose of the IS can be amplified. For example, Bayly (2000) showed that the manual gathering of information and the gradual degradation of these manual information systems led to a loss of grip by the British on their Indian empire. Wright (2007) explicitly seeks to “resist the tug of mystical techno-futurism and to approach the story of the information age by looking squarely backwards.”

This paper outlines four examples, two from existing literature (Cuzco and Sumer), and two novel examples (Shuruppak and Hattusa). In each case the purpose of the information system is identified within the political power structures and how it supports the self interests of the ruling dynasties. This leads to a discussion of modern information systems and their political drivers.

Rather than being objects of rational management, information systems should be viewed more in the light of public choice theory, as levers and sources of rhetoric in the cynical pursuit of political power, sought through statecraft, natural self-serving acts and people pursuing their own good.

2.0 Information Systems in Four Lost Civiliations

The following describes four case studies where information systems supported the development of civilisations.

2.1 Shuruppak

Shuruppak was a Sumerian city, once the home of the Sumerian Noah, and the site of the Flood and thriving in 3000 BC before it was burnt down (Leick, 2001). Shuruppak was a very early urban centre, a prototype for a city. It drew in and managed rural resources through administration. By administering and controlling farms, crops and human labour, it could

secure the food and resources it needed to grow a city, its tentacles feeding off the land. Shuruppak was important as an early example of the evolution of cities, a phenomenon that spread across Mesopotamia. Shuruppak contained an early example of a writing system and the development of lists. It was these lists, these texts which made urbanisation possible.

At the heart of the city was an administrative system which controlled the resources that the city needed. The structure and life of the city was sustained by flows of information that drove economic activity, that enabled people to live off food and goods arising from the activity of others and hence for specialised city living to arise.

In the desert mound, the burial place of the city of Shuruppak, nearly a thousand tablets have been recovered. These display some of the earliest forms of writing, of lists which enabled the city to run. In one building, called Tablet House, some 322 tablets were found, resembling a dynamic computer, administrating a workforce of 2000 people serving the city's needs. The lists document the activities of numerous managerial workers. The lists cover a short managerial period of no more than six months. They are a set of documents with fixed expiry dates which were archived or destroyed after a given time. An early computer-in-clay, they acted as a means of enabling an economic environment.

So Shuruppak contained an information system, housed in Tablet House that enabled the city to control and manage resources and hence have a complex society. There was a language used to represent the information. Scribes learnt the language through copying out lists of categorised items such as animals and writing out stories. There was an information system which contained a representation of the world, a model. The manipulation of this model supported the manipulation of the world in which the Sumerians existed.

Shuruppak was ruled by a king who was seen as a representative of the Sun God. The location of the key temple of Sun God worship in Shuruppak resulted in the formalisation of the king's power base and economic growth as other Mesopotamian city states brought offerings to the temple at Shuruppak. The tablets in the tablet house supported the distribution of resources such as food by managing and controlling the 2000 staff responsible for the distribution. The records were managed in an administrative centre, connected to the military and thus to the power of the king. It may be surmised that the purpose of the Tablet house was to structure the control of resources in accordance with the instructions of the king. Hence the tablet house information system underpins the power and authority of the king in Shuruppak.

2.2 Sumerian City States

Even before the time of Shuruppak, civilisations existed in Mesopotamia. One of the earliest human cities was Sumer, active between 6000BC and 2000BC. The first human cities were enabled by year round agriculture which led to hierarchical social organisation, the division of labour and the invention of record keeping and writing.

In the area of Sumer clay tokens have been found of many types and shapes (Beynon-Davies, 2009a) Firstly simple clay tokens have been discovered. Each represented a unit of goods, a measure of something produced by agriculture. For example, a conical token signified a measure of grain, a cylindrical token a single animal such as a sheep, a tetrahedron a unit of labour and an ovoid token a jar of oil.

These were counters. One token represented an actual unit of commodity. They enabled persistence. The development of these simple tokens coincided with the development of agriculture.

Later many more shapes appeared. Such a rectangles and disk. The tokens also had markings. Now they represented finished goods – bread, tools, vessels. The tokens had discrete but easily recognisable meanings. 492 subtypes have been found. The tokens could now indicate properties – type, sex and age of a sheep, for example. The appearance of complex tokens coincided with increasing urbanisation.

Each token indicated a specific occurrence of an item. There were no numbers. But the tokens could be found collected together in clay envelopes representing transactions – signed, annotated and baked. Also, they were found collected in jars. These tokens support extension and persistence of the human communication capability.

Significantly, the counters supported social hierarchies. They were Instruments of power for the elite, controlling goods and privilege, supporting decisions about resource distribution. They were found primarily in public buildings where they enabled bureaucracy and control. They have been found associated with powerful rulers, as indicated by occurrences of the ruler's seals near the tokens. They have also been found in religious buildings. They were only found in 12 of 1000s of Sumerian graves.

The location of the tokens in public administration centres, the graves of high officials and near royal seals suggests that the Neolithic information system was associated with the power of the rulers and the power of resource control.

2.3 Cuzco

Another civilisation existed in the Andes from 1200 to the Early 1500s. The Inca empire, with its capital at Cuzco, stretched from Ecuador to Northern Chile. It was really a confederation of local rulers, controlled by an Emperor. The empire constructed terraced fields high in the Andes, large temples. and a road system including tunnels and bridges, and one road which stretch the length of the South American Pacific coast.

The common people were grouped into squads and families of ten with a ‘boss’. Work was both agricultural and administrative. The language was Quecha, but there was no writing system. All movement was by foot because Incas didn’t know about the wheel. Society was organised round the worship of the Sun God, who was seen as the father of the Royal Family. The empire survived until 1531 when the Spanish, led by Pizarro, captured and imprisoned Atahualpa, the thirteenth Inca emperor at Cajamarca, and eventually executed him. Because the empire depended too much on central authority, this quickly led to the collapse of the empire.

Communication and control was achieved by the encoding of complex messages on quipus, which were rope structures, containing a variety of rope lengths, knotting patterns and colours. These were carried between cities by trained runners, along an specially constructed infrastructure of mountain paths with regular resting places.

Use of the paths was restricted to the runners and only certain people in town and villages were trained in the encoding of messages in quipus.

Civilisation	Power Stakeholder	Authority Maintenance	Information System	Information System Purpose
Shuruppak Mesopotamian city state.	King of City	Sun God worship Location of Sun God temple.	Management of human resources in the provisioning of the city.	Control of resource particularly food distribution.
Sumer Mesopotamian city states	King of City	Public bureaucracy.	Management of resources and transactions	Control of resources by powerful rulers.
Cuzco Inca Empire	Inca Emperor	Religious ritual and coercion	Management of resources and people movement	Directing of resources towards emperor

Hattusa Hittite Empire	Hittite king	Development of religious ritual,, coercion and violence	Management of resources	Control of resources and army.
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Table 1. Information Systems in Four Lost Civilisations

2.4 Hattusa

The Hittites established an empire between 1400 and 1200 BC, with its capital at Hattusa. They were famous for using iron and developing chariots. They were ruled by a hereditary line of Kings who were religious figures as well as military leaders. Referred to as ‘My Sun’, the king toured Hittite holy places, acting as a high priest. He created a brutal but effective army and ruled by fear and coercion. Hittite cuneiform writing on tablets has been found concentrated in Hattusa, near the temples and the location where the King live. Thus Hittite cuneiform archives are inextricably linked to the needs and survival of the extended royal family that constituted the Hittite ruling class (Weeden, 2011). Tablets are found in palaces of strategic importance to Hittite economic and military interests. Where tablets are found outside Hattusa, they appear in the circuit of towns the king visited during festivals. The presence of royal seals correlates with the presence of cuneiform writing. Furthermore, it looks as if the only documented scribal school is in Hattusa, near the Temple and royal quarters.

3.0 Commonality between the Case studies

The four cultures and their information systems briefly reviewed above have common characteristics which demonstrate the key power role which information systems play.

Power is retained by an elite whose goal is to legitimise and secure their own self-interests. Each civilisation has a primary ruler, the king or the emperor. That power is reinforced by various mechanisms. The development of the religious role of the leader as a god, or the sole representative of a god, underpinned their power. . The king of Shuruppak represented the sun god and promoted Shuruppak as the centre of worship for that sun god. The Inca emperor is revered as the incarnation of the sun god. The Hittite king was the high priest, the sole access to the sun god. Sumerian kings recognised the importance of religious patronage to legitimise their power claims. Such effects are also seen in other empires such as the Babylonian empire where the King’s religious role was seen as being very important; for example, the last king before the fall of the Babylonian empire, Nabonidus, expended much

effort restoring ziggurats and temple in many cities including Ur (Roux, 1992, p382). Another example is that of the Hittite king who spent much time leading religious rituals and moving from city to city leading services and sacrifices.

Power expressed in religious terms was reinforced by military might and coercion. Hittite society was violent and oppressive. Death was always near at the whim of officials and military power backed up by technological prowess in chariot building. Atahulpa's army backed up his legitimacy as the sun god. In city states such as Shuruppak, with less military might, there may have been an increased role for bureaucracy as a legitimising force.

Power is then backed up by the control of resources. In Shuruppak food and other resources are distributed to city dwellers according to the king's decisions encoded in tablets. Sumerian city states are based on the corralling of resources by an elite and the development of bureaucracies to manage the population as servants of the self-interests of the elite.

The information systems at Shuruppak, Sumer, Cuzco and Hattusa display some common characteristics. They are all located at the centre of control structures. They follow and align with the power. They can be found near the King. Tablets and evidence of information systems are located near evidence of the elite as identified by the presence of royal seals. Indeed, in the case of Hittite kings, the presence of tablets, that is the information system artefact, the alignment is so close that they trace the movement of the king. The information system is associated with the temple, the legitimising force.

Additionally, the development of the technology, the tablets and sign systems, and the knowledge required is closely aligned with the power bases. The scribal schools are near the royal residence. In the Hittite empire, the scribal school is solely located in Hattusa, near the palace. In the Inca empire, access to the infrastructure which enables the movement of messages is controlled by the king. Knowledge of the technology and the usage of the technology, the quipu, is restricted to trained experts, authorised by the Inca king. Thus both the resources and the information system by which they are controlled are closely aligned to the power structures and the governance of the elite.

In each case, the purpose of the information system derives from the power structures. We may describe the information in terms of the users, the scribes and the managers who record information concerning human and material resources. We may describe the information system in terms of how it helps feed people in a city state and helps people know what tasks they are to do. But ultimately the purpose of the information system lies in serving the self-interests of an elite and preserving the power base of the ruler.

There is no reason to assume that the purpose of present-day information systems is any different, driven by the interests of powerful stakeholder groups in private sector organisations or in government.

4.0 Discussion

The effect of power on the nature of information systems and technology is not an area raised in Beynon-Davies' study (Beynon-Davies, 2011). The strategy of examining historic cultures and the information systems associated with them produces new insights into signs and the way information systems work in transmitting information. But this does not say much about why they are used.

The stripping out of the technology demonstrates that the collection and management of information is fundamental to the organisation of human society and therefore that some kind of information system is fundamental to human society. Cities developed in Mesopotamia because primitive sign systems could be used to record and manage resource whether human, military or agricultural. And such control of resources enables different roles to be undertaken, a division and specialisation of labour which enables a complex society.

But every organisation or society brings with it a concentration of power and the establishing of an elite which thrives by pursuing its own self interest and arranging societal structures to suit its own purposes. Since the development of structure in society requires the management and organisation of information, the development and control of information systems is fundamental to the development of power structures.

Hence the study of information systems should be underpinned by political studies and an understanding of the power structures which are written into the processes and information collection supported by the information systems; and which drive the implementation of the information system. Insufficient attention is given to the role of policy and politics in information systems. Developmental studies tend to be localised addressing the shortcomings of local implementations and ignoring the macro politics of developing countries. Studies in information systems development focus on methodology and pragmatics, for example, examining local control of behaviour through agile development methods, controlling objectives and practice (Cram and Brohman, 2013), rather than examining the policies and forces which the information systems developers are submitting to. It should be noted that the development of methods such as extreme programme were reactions to a perceptions of developers that project management was dictatorial.

In discussing IS development, a key area of research should address the derivation of the business case, the politics behind the business case and the way in which the business case influences the IS development and the consultation of stakeholders during the development of requirements. Political and power goals may be represented as rational calls for efficiency, user empowerment, customer service, and usability. Such rhetoric then obscures the pursuing of self-interest which drives the top management support which is seen as so essential for successful information system implementation.

Power structures determine whose self-interests dominate, and whose self-interests are pursued. The information system then reinforces the predominant interest. Therefore we should be asking: whose interests are being served by the information system? The self-interest that the information system serves are unlikely to be those of the users, nor of those whose information is being held. Rather the information system serves to align tasks, activities and information to serve the interest and power base of a dominant stakeholder.

A customer relationship management system does not serve the call centre operatives as users of the system nor the customers as subjects of the system. Rather the interests served are those of the owners of the organisational system and their managing agents. The people who benefit from an information system are not always those who as developers and users bear the cost.

It should be asked, for example: why are post-implementation evaluations rare and benefits management not pursued? One answer is that the purpose of the information system is not to be found in the formal benefits identified in business cases and cost-benefit analysis, but rather in the informal interests pursued in the power agendas of certain stakeholders.

A critical examination of how power and self-interest drive information system development has a particular relevance for social computing. We may see Facebook as a system which serves the billion-plus users in providing tools to support their social life. That leads information systems researchers to focus on how Facebook communities develop. Rather, the purpose of Facebook is to serve the self-interests of the company and its shareholders by providing a source of personal information which can be drawn on by its advertiser customers. To use an analogy, a flower produces nectar to attract bees, but not for the bee's benefit. The flower has its reproductive purpose which the bee serves. Similarly, the nectar of functionality attracts users to Facebook so that Facebook can extract valuable information. A fragile symbiosis exists whereby Facebook needs its users to achieve its own purpose. This fragile relationship fractures when demand for greater privacy threaten the availability of the information resource Facebook requires. An understanding of the purpose of Facebook and the power inside Facebook, and wielded by its shareholders is an area study which may reveal

much more about the development of Facebook and its functionality than any study of end users.

5.0 Conclusion

The brief case studies presented in this paper demonstrate the significant role of information systems as instruments of power, and the role in politics. Information systems underpin institution as structures of self interest. Research is needed to understand the role of policy and politics in determining structure and function of information systems in organisations. Techniques such as critical lexicography (McBride and Stahl, 2009) should be applied to tease out the underlying power agendas behind information system implementation and explore the self-interests of the stakeholders.

Information systems are then political machines, driving political agendas within organisations and governments, and should be studied as such. For example, the study of NPFit has progressed by assuming that NPFit was about putting the citizen as the centre (Currie and Guah, 2007), concerning choice and public value. Examining this through the lens of the theory of public policy points to an unsustainable assumption that NPFit policy decision were made logically and rationally by enlightened politicians and NHS managers pursuing the public interest, What is more likely was that NPFit was a product of the self-interests of politicians and civil citizens, and an instrument of power which floundered when it collided with the other self-interests of strong stakeholders within professional organisations, lobby groups and Individual self-interests and motivations, acting in many hierarchical levels in the NHS.

Political machines require political approaches to their study. Information systems researchers should seek new lenses, such as the theory of public choice, from political studies and economics, to shed light on how information systems reproduce and enshrine power structures, and encode the self-interest of dominant groups whether the democratic majority or the dictator or absolute ruler.

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