

Understanding Feral Systems in Organisations: A case study of a SAP implementation that led to the creation of ad-hoc and unplanned systems in a large corporation.

Luke Houghton
Griffith Business School, Griffith University
Queensland, Australia
L.Houghton@griffith.edu.au

Don Kerr
Griffith Business School, Griffith University
Queensland Australia
D.Kerr@griffith.edu.au

ABSTRACT

This paper investigates the problem of feral systems creation as a possible response to an SAP/ERP systems type implementation in the supply chain work environment of a large corporation. In particular this paper examines a case study of a SAP implementation where evidences of feral systems have been found. Using a case study approach and extensive interviews the researchers found that a SAP system was rigid, highly structured and ignored by elements of the social system. Moreover, it focused on technical prowess of the SAP solution at the apparent expense of supporting real world activity. Such a focus allowed the spontaneous creation of “feral systems” that involved ad-hoc processes used to get around the SAP solution, in order to complete important work. This paper raises concerns with such enterprise wide systems and seriously questions the ability of SAP systems in their support of real world activity. The paper begins with an analysis of the feral systems concept, and then examines the case study of feral systems in the organisation in question. The paper concludes with a call for future research into feral systems and their effectiveness on ERP systems to support real world activity.

KEYWORDS: SAP, Enterprise Wide System, Feral Systems, Social Systems.

INTRODUCTION

SAP (Systems Application Protocol) and ERP (Enterprise Resource Planning) type systems are widely known enterprise wide Information Systems based solutions. SAP has seen tremendous growth and development as a package and continues to enjoy widespread success across the globe. From an academic perspective the research conducted into SAP has been limited with social issues or “soft” issues being largely ignored in general in favour of ontological analysis modelling (Wand and Weber, (2004), Rosemann and Green (2002), the benefits of SAP (Scott and Vessey, (2002) and how SAP can be improved (Hillson (2001). Of the research literature that is based on soft issues, authors such Al-Mashar and Al-Mudimigh,(2003) suggest, that SAP systems are in need of improved change management strategies. These authors further suggest that a lot of the factors concerning the implementation of such systems were of a social nature. For example, a lack of communication, lack of ownership, lack of change management strategy, lack of social support and other related issues. Kraemmergaard and Rose (2002) suggest managerial competencies are required and:

“Managing the changeover to a new ERP [enterprise wide type system] system is exceptionally complex and requires a wide variety of knowledge (business, technical, human, organizational) skills (managerial, political, project management) and the ability to develop both in practical situations.”

Kraemmergaard and Rose (2002) derived a list they considered to be relevant as required skills for managing ERP implementations. One such skill is mentioned as organizational competence. The authors argue that this competence is the ability to work with the organization, its culture, power distribution and history in a successful manner. That is, any successful ERP implementation should take into account, the history of the social environment and the distribution of power within an organisation.

During the course of recent investigation into supply chain management operations in a large corporation, evidences of a misunderstanding about the distribution of power were revealed. The research found several instances of people bypassing the implemented package to use their own devices, within the context of the social environment, to get around the system at the operations level. That is, the ERP implementation was there but it was ignored for a kind

of “skunk work” (Tushman and O’Reilly,1999) activity that involved employees developing systems deemed to be relevant to their own area of work but not condoned by management. Such systems are referred to as “feral systems” in this paper.

This paper explores firstly, the concept of a feral system. Secondly, the paper presents a case study where evidence of feral systems was found. From this case, a discussion is drawn about the rigid nature of ERP solutions and how the qualitative data suggested that this might have been a contributing factor to the development of the feral system. The paper concludes with directions for future research.

BACKGROUND

In the world of ideas and action (*Lebenswelt*) the introduction of any kind of standard or normal value system creates a type of tension or conflict. The tension itself appears to result when a group of individuals or a small element begin to form alternative values to what is considered to be “acceptable” and “mainstream”. Following the creation of alternate values, differing worldviews (*Weltanschauung*) are created leading to a paradoxical situation whereby stakeholders or actors in an organisation begin to form groups of people with alternate views to the mainstream ideal (Checkland, (1981).

These ideals essentially are the result of an incompatibility of ideas between a dominant group (management) with a non-dominant group (people under the control of management). Such groups that are non-dominant do not share a common point of view with management and are motivated to find ideals through experience and a kind of ad-hoc process building because of pressure to create or work under certain circumstances. In highly centralised arrangements the power of an organisation has long been argued to exist at the top of organisation and filtered downward. Other researchers have argued that the power in organisations exists with the political elements (Jackson, 2000), (Ulrich, 2003) to the extent where political elements are the determining factor for the distribution of power.

However, conflict as argued in Morgan (1997) arises whenever interests collide. In terms of power distribution in organisations, those that are under “control” will have different interests to those who are in “control”. For example an operations manager would have different interests to those who are actually under their command. The authors recognise that this is not the case for every organisation and is only used for the purposes of discussion here. It is

highly likely that other problems such as unrealistic work demands and failure to appropriately communicate ideals and purpose could relate to such issues.

Morgan (1997), in referencing the classic study of W.F. Whyte titled *Money and Motivation* suggests:

“The workers know that to maintain their positions they have to find ways of beating the system and do so with great skill and ingenuity.”

Morgan’s (1997) discussion raises some issues for consideration. What if the “system” is being got around and differing arrangements are made than those laid out by the controlling party? What if the controller is left to make sense of the operational unit’s activity because the rules they laid down are ignored and a feral system emerges. The feral system again has its own rules and organisation to the extent that it is out of line with organisational policy, yet still retains some kind of effectiveness within the structure of the company in question.

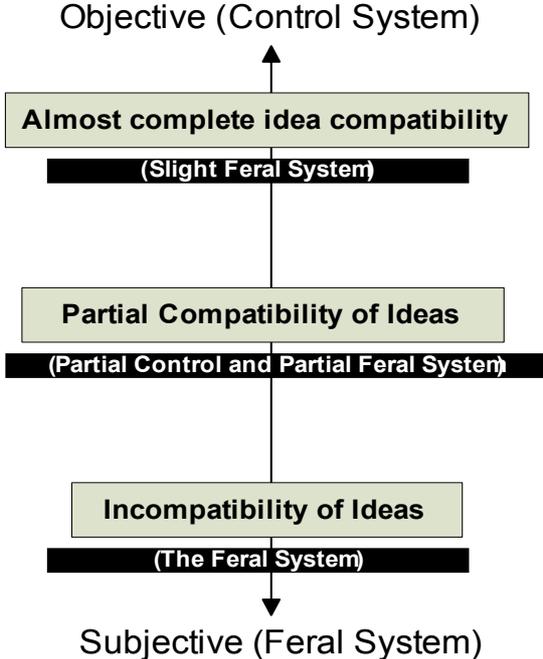
THE FERAL SYSTEMS CONCEPT

Feral Systems then are defined as “breakaway” factions that perform work by finding either their own methods when no guidance is given or as result of aforementioned tension, become feral out of a strange sort of rebellion. The term system above refers to something other than a computer system and follows the lead of Checkland (1981) and takes the system being something representing a “whole”.

Therefore, any use of the word system then refers to a collective entity of some sort in this paper and should not be taken to mean just a social system or just a technical system. Such rhetoric would dissolve the concept of feral systems and what could be learned would be done so through a narrow frame of reference. This framework presents the idea that Information Systems are purely technological and not socio-technical arrangements (Stamper (1997). Therefore, any feral system will contain social elements and technical elements (if required). The case presented later examines the feral system and its technology.

The word feral is taken to mean anything that is in a wild state or something that is not “tamed” or considered to be out of control to the extent that it is not manageable by outside parties. Therefore, as a concept, it is describing wild or “untamed” collective entities. In other words, they are untamed groups that for purpose of survival and/or rebellion have adapted to environment in which they find themselves. In terms of the ERP, they are groups within the organisation that may have formed to get around the strict structure of the ERP by developing alternative methods.

Consider the following diagram:



At the top of this scale diagram is the objective dimension of the organisational system and the end of the scale is the subjective element. As with most models of this type, arguably nothing is completely objective and nothing is completely subjective. Rather, it is a scale that can be used to further the discussion on feral systems in so much as it can provide a point of reference when discussing perceived levels of feralness.

At the first level is the phrase “almost complete idea compatibility” followed by a description “Slight feral system”. At this level the organisational unit in question is mainly objective and adheres to organisational policy and/or standards. Very little evidence of feral systems can be found and a control system is maintained. That is a relatively safe system or a control system is in place and thus no issues of feralness can be found. An example of this end of the scale

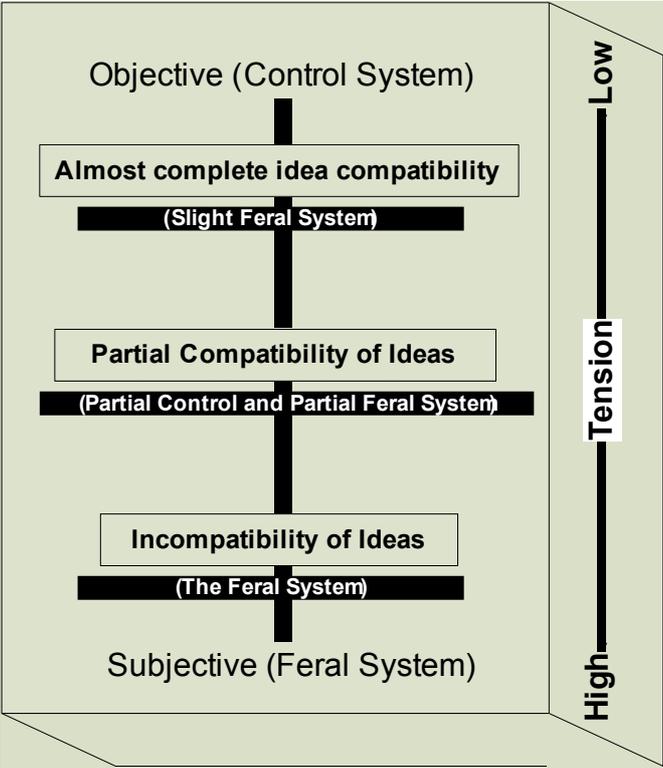
could be an Army where each soldier does what he or she is ordered to do with little scope for differing ideas. An example of an organisation at the other end of the scale could be the 3M company who has a culture of giving employees “the freedom to take risks and try new ideas” has given the company a “steady stream of products” and a worldwide reputation of innovation (3M 2004). The notion of “idea compatibility” refers to the level of agreement in parties on how work should be performed. Specifically it refers to Checkland and Holwell (1998) and the concept of the framework of ideas.

The framework of ideas concept is used in Checkland’s work to describe what he calls the placement of an intellectual framework into a situation of concern (Checkland and Scholes (1991)). However, the concept of the “framework of ideas” extends itself to this discussion on feral systems. This is because a framework of ideas is essentially a concept that describes a collective group of notions forming in a coherent shape or form, whether they are put into a situation of concern or not. Senge (1990) reflects this as a Mental Model, which he argues, is the basis for all interpretation of perceived reality. However, for simplification purposes the term framework of ideas is taken to be the same as mental model but a mental model in a more the fluid sense or a model that is not expressly a simplification of reality but a device used to make sense of it. That is, the framework of ideas is the conceptual foundation from which reality is perceived, through the human being but it is not a simplification; merely an observation and a formed point of reference from which structure of reality is based. If it were a model it would be a simplification (as Senge (1990) argues) but in this case it’s not a simplified version of reality (as if reality might “exist”) it is a frame of reference used to interpret what reality is perceived as by the individual.

In terms of organisations the framework of ideas concept represents the commonly held beliefs in an organisational group and what perceptions are shared about the work environment. The framework of ideas can also be understood as the ideological superstructure that forms the basis for perception of reality. This superstructure is a cultural item in as much as it is created by the members of workgroup and shared by most people in the situation. From this superstructure the values and hence beliefs can be understood and investigated for further research or analysis. However, in organisational life there traditionally has been a penchant for largely structured organisations to be overly hierarchal and bureaucratic. Thus, the power of the organisation is filtered from the top down and a “chain of command” separates the top and the operational levels of the organisation in a

totally centralised organisation. Hence the ideas of the management element of the organisation are naturally separated from the ideas of the operational element.

This separation creates many problems for management (most of which are outside the scope of this paper) as argued elsewhere (Morgan (1997)). The separate ideals of management and the operational units create a tension, as argued earlier which results in various levels of incompatibility between the ideas of one element and the other. This paper argues that the tension leads to feral systems forming, which find ways or circumventing the established management ideals in either complete rebellion or a form of sense making. This allows a further extension to the earlier diagram:



The underpinning argument is that tension arises from the level of incompatibility with management ideas. It is important to note that the tension caused in this case is not necessarily from conflict with management ideals. Conflict is but one avenue for tension to arise. Another avenue is tension when management fails to explain the role and properly train operational units for it. Such lack of interest would not necessarily create conflict but it would create a need for sense making and feral systems could emerge from that. On the flip side to this the feral system created could be intentionally done and suggestion in Rogers (2003) discussion on Skunk Works. However, such intentional systems creation was done for innovation purposes and not necessarily out of tension as argued for by the authors of this paper. This paper argues that tension can possibly be created through whatever means and whenever such tension arises the framework of ideas of the operational unit and the management team begin to experience various levels of incompatibility as mentioned earlier.

The levels of incompatibility create degrees of feralness ranging from slightly feral to completely feral¹. A completely feral system would be one that is detached from the organisation and performs its own operates and completely ignores management practice. Further, feral systems create their own technology and software systems to use to support their feral activity within the sphere of existing organisational resources. That is, feral systems creators make use of the organisations technological infrastructure when they want and integrate with their own feral devices (such as spreadsheets, databases etc) . In turn this means their own systems, their own way of operating and their own information systems.

The case presented in this paper shows an example of how a SAP solution was found to be inadequate (SAP R/2 at the time, now R/3) which led to feral systems development and the subsequent development of feral technological systems as well. This case will now be discussed.

¹ A completely feral system is unlikely to eventuate because this scale is only used for sense making purposes. The authors realize that such a system is both epistemologically and ontologically impossible.

THE RESEARCH PROJECT

The program to be examined is a multi-disciplinary research project into supply chain operations of a large corporation. The main purpose of this project was to first understand how the supply chain operated and then to create an effective model for managing the supply chain operations. From the outset the project was inherently complex in that it aimed, rather ambitiously to understand the notions of supply chain and how it could possibly be managed. The investigation began with use of various techniques to uncover how to manage and understand the supply chain. In order to understand the degree of ferality of the systems, a brief discussion on the research performed so far needs to be undertaken.

One of the more qualitative modes of operation used was the Miles and Huberman (1994) developed Nud*st “thematic analysis” approach. They developed this to find the common themes and patterns in qualitative research data for the purposes of understanding and making sense of research situations. In this case it was used from a critical realist (Mingers, 2003) perspective to try and critique the mode of operation. The perspective is critical realism because it is trying firstly to explain and understand the underlying elements of the supply chain then it aims to develop a theory to engage into the situation, for the management of it. The researchers recognise that they are trying to understand a phenomenon and the structure underneath it in order to create an epistemology of it, to later evaluate and learn from. In order to get to the point where there was a model, there needed to first be some analysis applied.

After an iteration of Nud*st very little thematic content was recognised. However, a group of the research team decided to ignore the coding of Nud*st and allow the common elements emerge through a rigorous 350 page review of the entire transcript collection. This process led to some interesting frameworks emerging from literature. The data indicated in many different ways that several key staff members weren’t using the SAP program in the process of supply chain management operations; despite the fact that it was available for them to use. However, these data should be viewed as tentatively as possible as it is part of a developing research program. These data should at least provide insights from which lessons can be

drawn and discussions made. Consider some of the following quotes from a high level official in the supply chain system:

“... we’ve got a diary that tracks all material usage on a daily basis so it will have on there how many rails we unloaded today so Bruce will come in write in the diary in what section, how many lengths of rail he does. That diary then goes into a database internally within here and onto a spreadsheet...”

Comments like the following are quite common where the technology at hand is not useful for operations environment. Consider this statement from an operations level manager :

“Interviewee: You can trust the system and dot all you eyes and cross all your T’s, and I know the logistics officers do that.

Interviewer: How do you know?

Interviewee: I just know.

Interviewer: Are there any people you don’t deal with but would like to, to get the job done. People you think might be of some help.

Interviewee: Sometimes any, with [supply company], but I should be talking to [the corporation] and they talk to [supply company]. I need to know. I could say I want 1000 tonnes this month. But if I could talk to them they might say 900 and I might be happy with that. That is where sometimes you need to short-circuit the system to get a good understanding each others requirements and not be pig headed.”

At this point the researchers noticed an emerging pattern with two major areas of interest. The areas where SAP would be most useful in routine situations (or structured situations) it clearly was helping in the not so routine environment of the supply chain. Consider another example:

“Interviewee: Yeah and I use that [SAP] to track like the inventory and now I’ve also got it to track my work orders and my line items and I can So that’s inventory coming in.....

Interviewer: Does any of this go back into SAP?

Interviewee: Yes through the database reports, so off the database we'll run a report...

Interviewer: The database you developed?

Interviewee: Yep Yep:"

This example was a more common occurrence in the text. Several key members of the supply chain spoke of different elements of the technology and complained for various reasons with similar answers. Two key elements emerged from the readings that the researchers found to be interesting yet not formed or emerging as formal patterns that Nud*st couldn't recognise.

1. Evidence of Feral Systems: The supply chain operations seemed to be working by itself outside the general scope of management. That is, the chain itself ran, but only a few key operational people knew how. The example above showed how a key operations manager frequently short-circuited the system to get the work completed. The text revealed that several people know the system and work around it in order to get the job done.

Other examples taken from the text include several key uses of technology in order to get around the "system" or the establishment. Some include: a fax machine to send work orders, the use of a diary to keep track of what's happening, the use of email to communicate work directives, spreadsheets for individual use that do not tie into organisational information systems and several cases of reorganising work to circumvent established principles.

Moreover, the research is beginning to show that the key elements of the supply chain forged ahead and short-circuited the system frequently to get work done. This means in essence that the way work was done or how work was performed and therefore it was created by the members of the supply chain to the extent that they had well organised procedures for operations based on their own technology and their own ideals. SAP though appeared not to meet the needs of the workers in this regard and appeared to be inadequate for the task.

2. SAP and its relationship to such systems: The use of spreadsheet was mentioned quite often and the examples shown above are common in the supply chain. The use of spreadsheets and other databases to feed back into SAP seriously question the “enterprise wide” nature of the solution. SAP appears in this case at least to have a level of inefficiency touched on in Al-Mashari and Al-Mudimigh (2003), in so much as it has its own standard to be adhered to rather than flexibly fitting into existing arrangements. SAP at least appears to be concerned with storing information and one manager argued that SAP creates a lot of information to be stored but it terms of supporting real world problem solving (i.e. supply chain operations) it was not used. Therefore, it appears to store data well and retrieve data effectively but it terms of support it appears to support the control system but not the feral one. This leads to the some interesting directions for future research

DIRECTIONS FOR RESEARCH

Feral Systems

The concept of feral systems was introduced in this paper and could possibly be useful in studying organisations for other researchers. Moreover, in this instance, key elements of a feral system were discussed and explored. Future researchers should seek to identify feral systems for exploration and exegesis in other contexts. It could be argued, that could be effective in some cases, such as the aforementioned one and be useful in sustaining management practice in such ill-defined environments like a supply chain. On the other hand, they may be reducing organisational productivity to the extent that business processes are doubling or tripling in some cases and this is not good for management practice. From a critical realist perspective, feral systems are created more out of tension and therefore in an unplanned manner, rather than an explicit decision to be decidedly rebellious and develop such systems out of spite. However, such feral systems should be investigated for further consideration.

SAP and Feral Systems

This finding was more of an aside to the main research findings but several interesting thoughts for SAP researchers are presented here. Firstly, if SAP is the one size all solution

and it requires better integration, how would or how could it suit a system that has developed feral? What SAP researchers need to find out is why SAP is so rigid and inflexible in situations where work is less defined and hence less routine. What about work situations that are based on subjective factors like intentions, motivations, perceptions and understandings instead of a good technological infrastructure? As suggested in Johnston and Milton (2003), Information Systems are socio-technical structures and intend to support real world activity. Some element of that will be non-routine and the question may well be, where is the provision in the ERP for such factors? Perhaps the feral system could inform the SAP system or vice versa. Because the SAP system is seen as a solution, to these kinds of problem, it is not well represented in the literature and it certainly does not appear to be a concern for researchers at large at this point in time.

SUMMARY

This paper aimed to present the feral systems concept and explain some examples of it in a supply chain project. The paper also discussed the use of technology as part of a larger feral system and raised issues about the nature of SAP and ERP applications to be effective in such non-routine work environments. The paper concluded with some research directions for feral systems and SAP.

REFERENCES

3M (2004) Innovations at 3M, Online www.3M.com/about_3M/innovation/index.html accessed April 19 2004.

Al-Mashari M and Al-Midimigh A (2003) *ERP Implementation: Lessons from a Case Study*, Information Technology and People, Vol 16. No.1.

Checkland P (1981) *Systems Thinking Systems Practice* John Wiley, UK.

Checkland P and Holwell S (1998) Information, Systems and Information Systems, John Wiley, UK.

Checkland P and Scholes J (1991) Soft Systems Methodology in Action, John Wiley UK

Huberman AM and Miles M (1994) The Qualitative Researchers Companion, SAGE, UK.

Hillson, W A (2002) The E-Business Workplace: Discovering the Power of Enterprise Portals, John Wiley and Sons, USA

Jackson M (2000) Systems Approaches to Management, Klower, USA.

Johnston, R.B. and Milton, S. (2001). The Significance of Intentionality for the Ontological Evaluation of Information Systems Proceedings of The Americas Conference on Information Systems, Boston, MA

Kræmmergaard, P., and Rose, J (2002). Managerial Competences for ERP Journeys
Information Systems Frontiers, Volume 4, Number 2.

Mingers J (2003) The place of statistical modelling in management science: critical realism and multimethodology, Working Paper No. 45, University of Kent.

Morgan, Gareth (1997) Images of Organisation, 2nd Edition SAGE, USA.

Rosemann, M & Green, P. 2002. Developing a meta model for the Bunge-Wand-Weber ontological constructs, *Information Systems*, 27(2), pp. 75-91.

Senge, P M (1990) The fifth discipline, Random House, USA.

Scott J and Vessey I (2002) Managing risks in enterprise systems implementations, Communications of the ACM, Vol. 45, Iss 4.

Rogers, E (2003) Diffusion of Innovations, 5th Edition, Free Press USA.

Tushman ML and O'Reilly III, C A (1999) Building Ambidextrous organisations: Forming your own "skunk works", Health Forum Journal, Volume 42, No. 2.

Wand Y and Weber R (2004) Reflection: Ontology in Information Systems, Journal of Database Management, Vol 15. No. 2

Ulrich W (2003) *Beyond Methodological Choice: critical systems thinking as critically systemic discourse*, Journal of the Operational Research Society, Vol. 54 pp. 325-342