FERAL INFORMATION SYSTEMS VIEWED THROUGH THE LENS OF STRUCTURATION THEORY

Anthony Spierings, University of the Sunshine Coast, Australia, ags008@student.usc.edu.au
Don Kerr, University of the Sunshine Coast, Australia, dkerr@usc.edu.au
Luke Houghton, Griffith University, L.Houghton@griffith.edu.au

ABSTRACT

A Feral Information System (FIS) is any information technology artefact that an End User employs instead of the mandated Information System. Structuration Theory provides a lens to view how Knowledge Workers have access to authoritative and allocative resources through the mode of domination and/or transformative capacity, to counter the traditional structures of domination that managers can employ. Further, a Knowledge Worker’s trajectory through time-space may provide Lebensstil (life style) opportunities that, if accepted, allow construction of a FIS. When Enterprise System supresses a Knowledge Worker’s productions function, they may resort to constructing a FIS to recover lost producer surplus.

Keywords: Feral Information System, Structuration Theory, Knowledge Workers, ERP, Enterprise Systems

INTRODUCTION

The trigger for this research is first hand observations of End Users constructing Feral Information Systems (FIS) in a number of different organisations. Organisations invest considerable sums to install an Enterprise System and have it working correctly [46]. Its proponents expend further resources ensuring that the Enterprise System is favoured over other information artefacts. For all of the technological prowess and weight of organisational might behind the Enterprise System some End Users are in the position of being able to choose to ignore it [6, 35]; with a subset of this group being able to construct an alternative [25, 40]. While there is recent growing interest, research to date has been relatively sparse. Surprising when one considers that global investments in Enterprise Systems is $US21B [70] and estimates of failure rates ranges from 40% [33], to over 50% [2, 26, 52], and up to 70% [42, 44].

The larger PhD study, which this paper forms part of, is not part of an Action Research project. Whilst having worked full-time at one of the study sites for nearly 30 years, the first author is not part of the action or close enough to significantly influence the action [15, 36]. The advantage of the principal researcher’s position, however, is closer interaction with the environments under study than is afforded the casual researcher [6].

DEFINITION REVIEW FIS, EU, ES

Feral Information System are defined by Houghton and Kerr [40] as;

“... an information system that is developed by individuals or groups of employees to help them with their work, but is not condoned by management nor is part of the corporation's accepted Information Technology (IT) infrastructure.”

This definition implies conditions that must be satisfied before labelling an artefact as a Feral Information System (FIS). First, the host organisation has a structure that supports centralised decision making for some or all aspects of its Information System (IS) needs. These structures often manifest a centralised Information System Department [13, 81]. Second, this Department has mandated the use of certain Information Systems for a specific whole-of-organisational process.

While accepting the general thrust of Houghton and Kerr’s definition, this paper notes other research that suggests End Users are not necessarily the exclusive constructors of FIS. An Information System can quickly turn from being the sanctioned system to one that the Information System Department is non grata about its usage, particularly post changeover to a new Enterprise System (ES). For example, consider a corporate Information System, originally constructed by the Information System Department. Post changeover it is now considered legacy. The End Users (EU), however, are continuing to employ the legacy system in defiance of the sanctioned new Enterprise System [33, 87]. The End Users have subverted the legacy systems into acting as a Feral Information System.

This paper proposes that Houghton and Kerr’s definition is refined to more simply state; “Any information technology artefact that an End User employs instead of the mandated Information System”. This definition draws its boundaries to exclude non-information technology artefacts, like paper-based systems. It also excludes desktop applications, like spreadsheets and desktop...
databases, provided the desktop application is not suborning the mandated processes.

Literature has other terms that overlap the definition of FIS: namely, Workarounds and Shadow Systems. Literature uses the term “workarounds” to describe actions that the End User has employed to manipulate the Information System and associated organisational processes. This spans actions that are either hostile to or supportive of the process of the host organisation. The literature often mentions the use of desktop spreadsheets and databases. Most of the literature that discusses workarounds has the perspective of watching an End User attempting to resolve tension between the demands of the Information System and their immediate work needs [6, 11, 12, 25, 29, 33, 43, 45, 63, 68, 78, 82, 87, 88]. However, some of the literature on workarounds also includes End Users resorting to “tricks”, like the forced reset of the hardware’s system clock, to manipulate the Information System [111].

Other works apply the term “Shadow System” in a similar vein, describing the use of Information Technology artefacts to assist End Users overcome, whether perceived or real, inadequacies in the sanction Information System [9, 33, 62, 67, 76, 87]. While there are subtle differences in context, for practical purposes, this paper considers the terms FIS, Workarounds, and Shadow Systems in the literature as interchangeable. As an aside, this paper notes that the term ‘Skunk Works’ is more applicable to describe project teams, no matter how well hidden from the rest of the organisation, which have the imprimatur of the Executive. Using the expression Skunk Works in this context then remains true to the original Lockheed Advanced Development Projects Skunk Works concept [37].

The species of Information Systems that this paper is researching is the Enterprise System. Organisations install Enterprise Systems to dispense with isolated systems and provide seamless data integration across the business [16, 44]. The notion is that a common data repository improves horizontal communication across the business. Access to a common data repository: breaks down silos, improves data absorption, and allows self-directed reaction [80, 87] to changing environmental conditions. Common data repositories improve the functionality of system integration across organisational boundaries [17, 23, 28, 29, 44, 54]). Often the literature uses the terms Enterprise Systems (ES) and Enterprise Resource Planning (ERP) interchangeably [17, 77]. While this approach is common practice in the literature, it overlooks the concept there are other Enterprise Systems that do not share their ancestry with ERP. ERP systems have evolved from Material Requirements Planning (MRP) software, which IBM developed in the late 1960’s for manufacturing plants. Gartner coined the term Enterprise Resource Planning, commonly abbreviated to ERP, in the early 1990’s. Gartner’s criteria for distinguishing and ERP from an MRP was the degree of horizontal integration across organisational silos [74]. Current ERP offerings include end to end business solutions for the entire organisation [34].

**REVIEW OF LITERATURE RELATING TO ERP/ES**

Organisations implement Enterprise Systems to improve business decision making, streamline the business processes, improve productivity, and lead to increased profitability [8, 39, 44]. For government and non-profit organisations Enterprise Systems are used to increase social good [35]. Implementing an enterprise system, however, is a complex undertaking [8, 45, 79], which involves considerable risk to the organisation. The expectation is that the rewards will be equally consummate with the risk [39, 55, 72, 80].

There is a substantial body of academic research available into why some enterprise systems succeed when others fail. A typical approach employed by researchers is a study of the Critical Success Factors [2, 5, 23, 26, 53, 58, 59, 69, 80, 90]. When comparing the works from the various authors, no clear consensus emerges from the literature as to a definitive list of Critical Success Factors. While there is a diverse range of views in the literature as to what the Critical Success Factors actually are, common themes keep reappearing.

First, the support of Senior Executives plays a key role in ensuring implementation success. Enterprise System implementations tend to create organisational tension. If the installation has asymmetrical impacts on the organisation, in particular positive impacts for its proponents and negative impacts for its opponents, some resistance is to be expected [29]. For example, instead of being in the best interests of the organisation, some use the implementation as a mechanism to promote their interests [57]. Another example is when proponents have a hidden agenda in the implementation with the goal to increase personal utility [42]. At times, these tensions can only be resolved at the Executive level.

Second theme emerging from CSF analysis is that organisations must select the correct system for the intended application. While the statement may be self-evident, it also simplistic in that understates the complexity in the selection process. Subtle and apparently minor differences that evaluation teams note in competing products may turn out to have major ramifications. Differences that is not
apparent until after an organisation has committed significant resources to the project, perhaps when the project is beyond the point of no return [54]. For example, the software may be too generic for the organisation’s needs [55]. Enterprise Systems are so intricate that most firms rely on the assistance from specialist consultancy firms [75]. Compounding the selection process are the occasions when the vendor knowingly supplies a product that does not suit the intended application [69].

The third theme from the literature on Critical Success Factors was attention to Business Process Re-engineering (BPR). Up until the early 1990’s, large organisations often wrote bespoke software to suit their business processes. There was a movement to reverse this practice during the 1990’s. Organisations were encouraged to accept, what is termed in the industry as, “vanilla” or “shrunk wrapped” software [61] from the vendors and re-engineer their existing business process to suit the software. Some consider BPR to be a form of neo-Taylorism [73]. If managers choose to install vanilla software, by default, they are agreeing to change their business processes to suit the software. Some other factors involved in BPR and an extended discussion is beyond the scope of this paper. Suffice to say that BPR now appears to have been a managerial fad of the 1990’s [27]. However, implementation teams must remain cognisant that Enterprise Systems will affect existing business process and take appropriate steps to manage the change.

The remaining discussion points in the literature on CSF include project management over implementation and cost control. In addition, there is a miscellaneous collection of other items considered critical by individual authors. A non-exhaustive list includes; good communication, lean team, access to specialist staff, change champion, training, and ERP configuration. This paper concludes that, while Critical Success Factors is useful information to avoiding common pitfalls, the continual high failure rate of Enterprise System implementations suggests that adherence to CSF alone does not provide all of the required answers.

FERAL INFORMATION SYSTEM

The Feral Information System concept was developed from a qualitative study at a large, mature, public Utility. The researchers were seeking to understand why the recent implementation of a large SAP R/3 was not as successful as originally envisioned. During the study, the researchers noted End Users developing and using alternative information technology artefacts, mainly in the guise of desktop spreadsheets, to the managerially sanctioned SAP Enterprise System. In one example, the employees were deliberately entering incorrect quantities of critical long-lead stock items into SAP, whilst tracking the true quantity in a spreadsheet. Further, the stock in question was stored in alternate locations to the nominal warehouses to hide it from the auditing process. In this instance, the employees were not engaging in embezzlement. Rather, they had built a hidden stockpile to accommodate operational requirements [41].

In untangling the issues, the researchers noted that the financial arm of the Utility was using SAP to drive down inventory holdings to save costs. However, this was at odds with the operational arm of the Utility that believed it needed a certain holding of this long-lead stock for emergencies. There were additional benefits in holding a large buffer stock. It covered inefficiencies in the upstream planning process for ordering long-lead plant items. The researchers drew on Foucault’s work to theorise that part of the problem was unresolved tensions in the “power relationships” between engineering and financial managers. End Users resorted to building an Feral Information System, to bypass the Enterprise System, in an attempt to resolve these power tensions [49]. The actions of End Users resorting to spreadsheets and desktop databases to facilitate their immediate information requirements are not a new phenomenon. It has a history that dates back at least three decades, with research in this area often referring to it as End User Computing.

END USER COMPUTING

The literature on End User Computing notes the arrival of the desktop computer, particularly the IBM PC and the Apple, in the early 1980’s as a significant change in the history of information technology [3, 10, 14, 20]. It would be a mistake to assume, however, that the arrival of the personal computer marks the start of End User Computing per se. There is commentary that End Users were struggling for access to computing resources on the mainframe for their own needs as far back as the 1960’s [83]. Knowledge workers, particularly engineers and scientists, were the vanguard of End User Computing in early epoch of computing [10]. Pre-dating the arrival of the PC there was debate in the MIS community over the concept of End Users writing applications in the then mainframe computing environment [56]. As late as the mid-1980’s, well after the introduction of the personal computer, over 70% of End User Computing was still occurring in the mainframe environment [3].
Some common themes emerged from a read of the literature. First, organisations face considerable installation and ongoing maintenance costs associated with Information Technology. For some End users, there is an allure in using the latest IT to displace previous manual work methods. Some managers are suspicious that End Users are distracted from doing real work in favour of playing with the latest IT. In economist’s terms, it is difficult for senior managers to separate End User “wants” from “needs”. Managers respond by instigating mechanisms to contain these costs, which leads to the second theme in the literature [60]. Most organisations responded by creating a centralised Information System Department (ISD) to contain costs.

Second, organisational tension then develops between the ISD and the End Users. End Users perceive the ISD as slow and unresponsive to the IT needs of other departments. There are examples from the mid 1980’s of ISD taking up to four years to create a report [3, 30]. Third, End Users respond by resorting to End User Computing to meet their immediate business needs, typically to improve Departmental operational flexibility. The fourth theme of note, particularly in the earlier literature is how Knowledge Workers as at the vanguard of End User Computing. Building a Feral Information Systems requires some degree of innovation. End User innovation in defiance of the managerial sanctioned tool set is not restricted to constructing IT artefacts; it was alive and well long before the information age [84-86].

**FIVE ROLES OF AN INFORMATION SYSTEM**

The Five Roles of an Information System is a theory developed by Askenäs & Westelius [7]. By adapting elements of Gidden’s Structuration theory, it examines how well the Information System matches the host organisation to derive an “IS fit with structure”. The IS Fit can range from poor to good. The second dimension of Five Roles is the level of control individuals have over their actions. This is termed “Direction of Control”, which ranges from the individual being able to control their actions to the Information System controlling the user’s actions. Drawing from Actor network Theory (ANT), Askenäs [6] assigned actor roles that the information system assumes within the organisation. From these two dimensions, there is a quadrant of possible actor roles. In the half of the quadrant where Information System is in control of the actions: if there is a good fit between the IS and the organisation the system is classified as a “Bureaucrat”. If the Information System is in control and the fit is poor, Five Role Theory classifies the system as a “Manipulator”. In the half of the quadrant where the individual controls the actions; if there is a good fit between the IS and the organisation the system is classified as a “Consultant”. If the individual is in control but the fit is poor, it is classified as an “Administrative Assistant” [6]. Figure 1 is a sketch of the four roles.

The fifth role in the theory, the “Dismissed” state, does not fit into any of the quadrants. In the Dismissed role, the End Users have rejected the Information System by deliberately choosing not to use it. In her case study, Askenäs [6] noted the salespeople had turned their ability to generate income for the company into strong bargaining power to overcome the Information Systems’ inherent power. The salespeople put forward the argument that using the Information System was affecting their productivity, reducing the company’s income. Hence, the salespeople had arranged to dismiss the Information System from interacting with them in any of the possible actor roles. Askenäs [6] did not explore beyond the dismissed state. Her work is silent on if there is a predisposition for End Users to reside on one or more of the four roles before entering the Dismissed role. This paper assumes that users who place the ERP in the Consultant role would be unlikely to progress to placing the ERP in the Dismissed role: whereas End Users who consider the ERP as a Manipulator or Bureaucrat would be more inclined to progress to the Dismissed role. As discussed earlier, there is a realm of End Users who not only dismissing the Information System, but developing an alternate Feral Information System as well. This paper accepts Askenäs [6] novel extension of Structuration Theory as a bridge towards deeper understanding of why End Users create Feral Information Systems.
STRUCTURATION THEORY

Structuration Theory grew out of Giddens’ early works on the writings of Marx, Webber, and Durkheim. For a theoretical framework that makes almost no mention of Information Technology, it has been widely cited by researchers interested in Information Systems [48]. It is a body of work that broad, deep, and dense. Reviewers have generally found it difficult to succinctly summarise his works [48, 89]. Comprehensive works that translate Structuration Theory to Information Systems include DeSanctis & Poole [18], Ferneley & Sobreperez [25], and Orlikowski [68]. This paper will concentrate on selectively appropriating elements of Giddens’ work for application. An approach endorsed by Giddens [48].

Giddens nominates three dimensions of structure: signification, domination, and legitimation. The related dimensions of interaction are; communication, power, and sanctions. Structure and interaction are linked through the modalities of: interpretive schemes, facilities, and norms. While Giddens loosely drew this as a table in Central Problems in Social Theory [31], secondary literature prefers the slightly clearer schematic provided in The Constitution of Society [32], which is reproduced in Figure 2

Of particular interest to this research are the modes of domination. Domination involves asymmetries in resources that is then used to sustain power in relationships [31]. In Structuration theory, the two main resources that provide domination are allocative and authoritative [31, 32]. Allocative resources is the capability “... to generate command over objects or material phenomena ...” and authoritative is the capability “... to generate command over persons ...” [31]. Of use is Gidden’s concept of how resources are the media of domination and access to a transformative mechanism. Transformative capacity in turn can feed back into the original mode of domination. If human agents have access, they may use authoritative and allocative resources in either modes of domination or transformative capacity on the structure of domination [31].

Figure 2 Dimensions of duality of structure adapted from Giddens, A 1984
DOMINATION OVER THE MEANS OF PRODUCTION

One definition of a knowledge worker is a person who; has formal education, the aptitude to employ both theoretical and empirical knowledge, the ability to think differently, and a commitment to continuous lifetime learning [21]. For the purposes of this paper, the interest in knowledge workers is that they own the means of production. As Drucker eloquently states:

“Employees who do manual work do not own the means of production. They may, and often do, have a lot of valuable experience, but that experience is valuable only at the place where they work. It is not portable. Knowledge workers, however, own the means of production. That knowledge between their ears is a totally portable and enormous capital asset. Because knowledge workers own their means of production, they are mobile.” [22]

Under Structuration Theory, this changes the structures of domination. As Knowledge Workers have access to the primary resources, the means of production between their ears, they are able to have some influence on the mechanisms of transformative capacity. As Drucker notes, Knowledge Workers are not able to achieve total dominance. For most, the relationship between the host organisation and the Knowledge Worker is symbiotic [22]. This paper argues that Enterprise Systems are attractive to owners by their promise to increase the owner’s control over allocative and authoritative resources. Owners have access to allocative resources because Enterprise Systems are a means of production, the purpose is to extract additional surplus value out of the workers. The Taylorist approach embedded in Enterprise Systems provides increase control over allocative resources within the organisation [38]. Owner’s gain access to increased authoritative resources through the built in workflow and auditing mechanisms programmed into the Enterprise System.

Some argue that managers are seeking to increase their span of control over Knowledge Workers [42]. Conflict can then arise between the Enterprise System and the Knowledge Workers. Particularly, if the means of production imposed by managers, in the form of the Enterprise System, clashes with the means of production desired by Knowledge Workers. This tension can lead to a power struggle. A Feral Information System within organisations can be one possible expression of this struggle of control over allocative and authoritative resources. While literature notes the existence of Feral Information Systems (and the associated Workarounds and Shadow Systems), plus extensive literature recording over forty years of End User Computing. One self-evident factor would be the skill set of the individuals in any given situation. If they have only basic computer skills, they are not in the best position to develop a Feral Information System.

Lebenschancen (life chances) along with Lebensführung (life conduct) are the two basic components of Weber’s Lebensstil (lifestyles). Unfortunately, there is a dearth of independent translations of Weber’s work into the English language. With some expressing concern that the sparsely available English works do suffer key mistranslations from the original German [1]. To avoid paraphrasing inducing any further derogation of Weber’s work, Abel and Cockerham’s interpretation is reproduced below.

‘Weber used three distinct terms to express his concept of lifestyles. These terms are ”Lebensstil” or ”Stilisierung des Lebens” which mean lifestyles, and “Lebensführung” (life conduct) and “Lebenschancen” (life chances), which comprised he two basic components of lifestyles. Lebensführung refers to the choices people have in their selection of lifestyles and Lebenschancen is the probability of realizing these choices. In Anglo-American sociology, the link between choice and lifestyles appears to have been overemphasized, while the connection between lifestyles and life chances has received little attention.’ [1].

Giddens makes a direct, but brief, mention of ‘life chances’ as part of his Structuration framework when discussion its interaction with authoritative and allocative resources; including the mobilisation of these resources across time-space [32].

LEBENSSSTIL (LIFESTYLE)

Why is it that sometimes End Users who reject the Enterprise System build a replacement, while at other times they do not? For example, on one hand, Askenás [6] noted how salespersons (End Users) rejected the Enterprise System but did not build an alternate. It was left to the organisation to respond by building a custom-made interface for the salespeople. On the other hand, Houghton and Kerr [41] also noted End User rejection of the Enterprise System. In their case study, the End Users rejection also included the development of Feral Information Systems. Recall the earlier discussed examples of Workarounds and Shadow Systems, plus extensive literature recording over forty years of End User Computing. One self-evident factor would be the skill set of the individuals in any given situation. If they have only basic computer skills, they are not in the best position to develop a Feral Information System.
direct discussion is sparse, clearly Giddens was aware of the impact of life chances. For example, the existence of homeostatic loops across generations in the cycle of being brought up in poverty, poor schooling, low-level employment, which leads to poverty upbringing for the next generation [31]. Other applications of Structuration theory to information system problems, for example Orlikowski et al. [63-68], appear to make no use of Webers’ Lebensstil. This paper suggests that has an important role to play in the development of Feral Information Systems.

Lebensstil forms part of the theoretical bridge between Askenas [6] Five Role Theory and Houghton and Kerr [41] work on Feral Information Systems. For a Feral Information System to exist, End Users must first be in a position to be able to “dismiss” the Enterprise System. Next, End Users must have had a suitable Lebenschancen and then chartered a course of Lebensführung to arrive at a space-time point were these skills provide the opportunity to construct a Feral Information System. For the best part of fifty years, knowledge workers, particularly scientists and engineers, have been teaching themselves to write computer applications to suit their immediate work needs. Knowledge workers are, by their very nature, self-motivated individuals who have the ability to acquire knowledge and techniques.

**PRODUCTION FUNCTIONS**

This paper accepts the premise that workers are rational agents who seek to maximise their reward and minimise their costs [24]. To prevent shirking, organisations employ monitoring. The level of monitoring is a function of the cost of monitoring versus the additional productivity gained from monitoring. Owners engage managers to act as their agent in monitoring workers to reduce the incidences of shirking [4]. The unskilled worker and the data operator have limited latitude in their work scope. It is relatively easy to monitor the unskilled worker’s productivity. However, when the workers are Knowledge Workers, they have considerable scope and freedom in the role. Owners and managers face higher monitoring costs of Knowledge Workers. Hence, there is a higher degree of trust placed in Knowledge Workers and this is realised through autonomy and responsibility [22].

Organisations face a range of costs; simple production costs, transactions costs, and information costs [4]. One approach taken is to express simple production costs in the form of a function,

\[ V = f(C, K, L), \]

Where \( C = \) IT Capital, \( K = \) Non-IT Capital, \( L = \) Labour [19]. The point here is that firms have some discretion in how they manage their inputs. For example, how firms allocated funds between IT Capital costs (C), Non-IT Capital (K) costs, and Labour (L). Indeed, organisations are investing in IT Capital in a manner that “displaces other inputs” [19]. This is not the limits of a firm’s costs; there is also the allocation of funds to monitor agents undertaking transactions on the firm’s behalf. Like the firm, Knowledge Workers find themselves burdened with tasks, which are effectively “costs”, which subtract time away from their primary task [22]. Knowledge Workers often have a choice of techniques (read inputs). Some of the techniques employed may include partial constructed or fully constructed technological artefacts. Some supplied by the firm, others supplied by the Knowledge Worker.

This paper proposes that Dewan and Min’s [19] production function for the firm can be adapted to gain insight to the production function for an individual Knowledge Worker. Dewan and Min’s [19] treated all labour (L) inside the firm as being equal. Because Knowledge Workers own the means of production (Drucker 1999), this paper proposes that Knowledge Worker labour and other labour can be treated separately. Unskilled labour can only provide unskilled labour. However, a Knowledge Worker can alternate between their own means of production and unskilled labour. Applying ration agent theory, Knowledge Workers will select a mix of inputs that will maximise their rewards and minimise their costs. These costs are unique to each individual: not only for their current position in time-space, but inclusive of their trajectory through time-space (i.e. Lebensstil). The use of supplied Information Systems, own artefacts (i.e. Feral Information System), and labour also implies an associated transaction and information cost. For example, if the Knowledge Worker elects to use an artefact supplied by the firm, the Knowledge Worker must accept information costs to learn how to use the artefact. An example of transactional costs may be the costs associated to extract data from the Enterprise System and translate it into a format that is used by their artefact. Another cost may be the effort to bypass the security systems around the Enterprise System so the End User can extract the required data [13]. However, when the Enterprise System is a good fit with the needs of the Knowledge Worker and it allows them
to feel in control of the actions, the production function strongly encourages the Knowledge Worker to stay with the Enterprise System.

Earlier, this paper discussed End User Computing. We noted that even when only mainframe computing was available, End Users were constructing programs and reports outside the nominal boundaries of the support provided by the IS Department. In other words, End Users were substituting their own artefacts for the firms IT Capital investment. The division between IS Departments and the rest of the organisation is even clearer post arrival of the personal computer, were literature provides numerous examples of End Users constructing Information Technology artefacts on desktop computers that the Information System Department did not even know existed. Some Knowledge Workers are prepared to reallocate their resources over the short term in such a manner that will increase the ability to build/improve artefacts: with the overall goal of increasing rewards and/or minimising costs in the long term.

Positioning this formula inside Gidden’s Structuration Theory adds richness. There could be various norms and practices [31] at the workplace that alter how and when Knowledge Workers substitute their artefacts for the firm’s artefacts. Not using the firm’s artefact may invoke some form of a sanction. Alternatively, the firm’s environment may tolerate or even actively encourage End User Computing [47]. This alters the input cost structure for the Knowledge Worker in a way that is hard to capture in a formula. Balancing the modes of sanction is our earlier discussion that Knowledge Workers often have access to allocative resources that can harness in a transformative capacity. A certain Knowledge Worker may be so valuable to the firm that it will tolerate his/her rejection of the Enterprise System.

Theoretically, an investment in IT Capital should only proceed when it will have a positive impact on the production function of the organisation. There are, however, examples of Enterprise System implementation, which this paper discussed earlier, where the change in production function is asymmetrical across the organisation. This includes; negative impacts on individual’s production function [29, 42, 57], use the implementation as a mechanism to promote self-interests [57], and hidden agendas in the implementation with the goal to increase personal utility [42]. Direct examples include Askenäs [6] noting how the salespeople felt the new ERP reduced the time they could spend on sales. Kerr, Houghton, and Burgess [49] noted how the new ERP reduced buffer stock, which the End Users felt was an impact on their productivity. We argue that when Knowledge Workers believe the Enterprise System is suppressing their production function the opportunity is ripe for the genesis of a Feral Information System.

CONCLUSIONS

This paper draws the following conclusions from the literature. First, Enterprise Systems still have an unacceptably high implementation failure rate. Second, implementation proponents assume that their modes of domination will be sufficient to override any structural dislocation that the Enterprise System may cause. If there is good fit between the Enterprise System and the recipient organisation, this assumption will stand untested. Third, if the implementation proponent’s modes of domination are supreme, the End Users have few options other than use the system. Although, this in itself does not guarantee that the Enterprise System will be a success in the long term. Fourth, in some organisations, the implementation proponents operate in a structure where some End Users also have access to powerful authoritative and allocative resources through the mode of domination and/or transformative capacity. In these circumstances, if there is poor fit between the Enterprise System and the End User’s needs, the End User can reject the Enterprise System and there is little that the Enterprise System proponents can do to challenge this rejection. Fifth, rather than resort to direct rejection, some End Users have the capability to give an outward appearance of Enterprise System acceptance while developing hidden artefacts, called Feral Information Systems. Feral Information Systems operate in a broad spectrum; at one extreme being a helper application to the Enterprise System through to the other extreme of replacing the Enterprise System.

Feral Information Systems will not necessarily arise in circumstances where the End User has access to modes of domination and/or transformative capacity. Webber’s concept Lebensstil, explain why some End Users have the capability to create a Feral Information System, while their colleagues with apparently similar qualifications cannot. Lebensstil explains why some identical circumstances can result in a range of Feral Information Systems, from primitive to sophisticate. However, access to modes of domination and ability to create are not enough to drive the creation of a Feral Information System. Economic theory informs that most End Users are rational agents. When the Enterprise System affects the End User’s production function, there is economic pressure on the End User to recover lost production surplus.

These conclusions present a number of interesting research opportunities. First, develop a qualitative study of End User perceptions over loss of
production function. Second, collect quantitative data that can measure loss of production function. Third, explore the premise that Lebensstil is a variable in the creation of Feral Information Systems through demographic data including education, employment history, age, etc. Forth, explore the modes of domination that FIS creates feel subject to or are able to subjugate.

Increased understanding around the circumstances that lead to the creation of Feral Information Systems could lead to developments that ease the tension between Enterprise Systems and the End Users. In turn, Enterprise Systems can become more efficient and accommodating of End User requirements. A reduction in End Users having to divert resources into Feral Information System will free up this production capacity for more productive purposes.

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