The Exploratory Study of ERP Systems Usage Problem and its Coping Mechanism: The Deployment of Feral System

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Abstract

The euphoria around ERP systems is wearing off due to challenges and problems that users face in both the deployment and usage phases. Problems encountered in using ERP might hinder the effective exploitation and continued use of ERP systems and their value to organizations. While identifying the problem alone is scarce, direction to recognize available alternatives as the coping mechanisms must also set forth. This paper aims to explore users' experiences in using ERP system and how they find ways to cope with the issues via deployment of 'feral system'. The paper adopts mixed method of 9 semi-structured interviews and 70 exploratory surveys, of one subsidiary of the leading oil and gas organization in Malaysia. The exploratory study reveals some ERP issues pertaining to system (unavailability of essential function, underutilization), data and interface. In order to cope with the usage issues, users rely on the use of 'feral system' (feral information system, feral use of technology and feral data). The theoretical contribution of this paper is in gaining deeper insight on the impediment of ERP system usage and the coping mechanism deployed. From the practical point of view, this paper could assist managers in providing lesson learnt from the case.

Keywords: ERP system, end user problems, feral systems, coping mechanisms, single case study.

1.   INTRODUCTION

ERP systems are evolving into a strategically central area for most organizations nowadays. Thus, to obtain the optimal advantages offered by this highly integrated system, organizations need to minimize if not eliminate issues pertaining to system usage. Unsolved problems in an ERP system make it difficult for users to adapt to the system functionalities in performing tasks, and hinder the continuing and extended use of the system   (Ceaparu, Lazar, Bessiere, Robinson, & Shneiderman, 2004; Deng & Chi, 2012). When ERP system usage problems are understood, actions can be taken to resolve the problems in a timely manner, which enables organizations to take advantage of the benefits offered by ERP. The usage problems in the post implementation stage of ERP could result in failure to achieve the promised ERP benefits (Yu, 2005). Boudreau & Robey (2005) which studied users' enactments suggested that although mandated to use ERP system, the institution's users initially found way to avoid them by reproducing work practices they have followed prior to ERP implementation

Previous studies are of the same mind that when a system does not accommodate legitimate organization needs, users employ coping strategies to overcome some of the flaws in the system (Bendoly & Cotteleer, 2008; Tajul-Urus, Molla, & Teoh, 2011) The identified coping strategies include improvisation (Monteiro, Jarulaitis, & Hepsø, 2012) and ignore or disregard the problems (Benamati & Lederer, 2001). Although some effort has taken to uncover the ERP usage issues and how your deal with these issues, yet it is still relatively under-explored research area, especially in regard to integrating coping mechanisms with post-implementation ERP system. Due to this gap it was crucial to conduct an exploratory study to get a better understanding of end users' experiences with an ERP system and how end user cope with such ERP issues. Hence, the objectives of the exploratory study were two-fold; (i) to explore users' experiences with issues and difficulties they encountered while using an ERP system and (ii) to explore users' experiences in coping with ERP system issues via the deployment of feral system.

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The remaining of this paper is organised into four major sections. First, the background literature on ERP problem is presented. This section will cover the ERP usage problem encountered in using ERP system and use of feral system as the coping mechanism. Then, we outline and discuss the research method. Following that, we demonstrate the analyses and findings from the exploratory study. Subsequently, we present the discussion on the problems and a model of ERP (SAP) usage problems and coping mechanisms. The last section offers the concluding thought.

2. LITERATURE REVIEW

2.1 End User Usage Issues of ERP System

System-related problems
The literature has identified ERP system quality, misfit, complexity and usability as major ERP system-related problems (Deng & Chi, 2012; Elbertsen, Benders, & Nijssen, 2006; Lin, 2010). While some researchers have looked at factors that influence an organization's use of an ERP system and the nature of the difficulties experienced during ERP system adoption in the ERP system context (Elbertsen et al., 2006; Soja & Paliwoda-Pekosz, 2009) , other studies such as that by Deng & Chi (2012) have examined the construct of system usage problems from a legacy IS perspective. An organization should also recognize the complexity of factors that influence individuals' perceptions, intentions and usage of information technology such as ERP. Hence, complexity issues also have been found as one of the commonly cited problem in ERP system usage (Elbertsen et al., 2006; Lv & Chen, 2010; Schoenherr, Hilpert, Soni, Venkataramanan, & Mabert, 2010).

Data-related problems
Previous studies have highlighted that ERP system usage problems mainly concerns with data-related problems (Deng & Chi, 2012; Haug, Arlbjørn, & Pedersen, 2009; Lin, 2010). The data problem originates from data quality. The business data of a company can be more or less useful, depending on the quality of the data. Poor data quality at the operational level increases operational costs because time and other resources are spent detecting and correcting errors (Redman, 1996). Data quality (DQ) is fundamental to ERP operating processes since ERP facilitates decision making and inter-organizational cooperation (Batini, Cappiello, Francalanci, & Maurino, 2009), and poor data quality could result in an underperforming system or even total failure (Momoh, Roy, & Shehab, 2010). Moreover, multifarious data errors could easily be flowed throughout the system due to ERP's automated and process-driven nature (Haug et al., 2009).

Interface-related problems
The main objective of user interface design is to make the user's interaction as effective as possible. Hence, an interface should be able to support a successful interaction between user and computer. Prior studies have revealed that interface-related problems could be one of the problems affecting ERP system usage as experienced by the end users (Arasanmi, Wang, & Singh, 2013; Singh & Wesson, 2009). The authors proposed navigation guides as indicators of a good interface design to enable end users to explore the capabilities of the system. A system interface facilitates information seeking and exploration of a system's features. Therefore, a user-friendly interface increases ERP usage efficacy as well as minimize the problem of limited system use. Their finding is aligned with other studies that have suggested that easy-to-use interface increases system usability (Choi, Kim, & Kim, 2007).

2.2 Use of Feral System as Coping Mechanisms

The coping mechanism domain represents mechanisms that overcome problems encountered in using ERP. Use of alternatives systems such as Microsoft Excel, Project and Access was frequently cited as the strategy to overcome the deficiency of an ERP system.

Feral Information Systems
A feral information system (feral IS) refers to an information system created and used by individuals or groups that is intended to either supplant or supplement a formal organizational information system (Houghton & Kerr, 2006; Spierings, Kerr, & Houghton, 2012; Thatte, Grainger, & McKay, 2012) in which information systems are created as comprehensive or complete systems with many elements that are highly interrelated and interconnected. The characteristics of feral information systems are that they are reasonably well built, have some degree of sophistication in their functionality, and provide mechanisms for inputting data, processing it and extracting output (Tajul-Urus et al., 2011). Feral information systems are usually non-sanctioned systems and operate outside an

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ERP system environment. An example of a feral information system reported in the literature is MyInfocom or Webfuse (Behrens, 2009).

Feral Use of Information Technology
Feral use of information technology (feral IT) refers to the use of information technology by end users to either supplant an ERP system function or to supplement the limitations of an ERP system. It usually includes the development and operation of self-built applications and is dominated by personal software such as Excel or Access (Rentrop & Zimmermann, 2012). For instance, Kerr &Houghton (2010), reported on how Excel and Access are used for planning outside the SAP system and how that leads to little or no visibility of the plan to the organization so that it is not reflected in the corporate plan.

Feral Data
Feral information systems and feral use of IT can lead to the third type of feral system, which is referred to as Feral Data. 'Feral data' refers to data stored outside a formal system such as ERP. For instance, users often extract data from a formal system such as ERP and make necessary adjustments or modifications as needed (Kerr & Houghton, 2008). However, when those users fail to integrate the data back into the formal system for operational, forecasting or knowledge management purposes, this can lead to the data being out of sync with formal systems and becoming feral data. Kerr & Houghton (2010) discussed an example of a feral data 'grass stock' which was different from the actual data reported in the ERP system and led to inaccurate forecasting and business analytics output (Kerr & Houghton, 2010).

3.   RESEARCH METHODOLOGY

A case study approach was used because a study based on interviews with key informants is commonly an acceptable method for the early stage of research (Yin, 1994). The primary data collection methods were semi-structured interviews and an exploratory survey. The case selected for the exploratory study was one of the subsidiaries of a leading oil and gas organization in Malaysia, identified henceforth as Case A. The case was selected by using purposive sampling (Cavana, Delahaye, & Sekaran, 2001). The selection criteria the case were based on the fact that (i) the company has implemented an ERP (SAP R/3) system for more than three years and are sufficiently mature to study any ERP system usage issues (ii) the company agreed to participate in the study, as accessibility is a critical issue in a case study research design.

The selected Case A is one of the subsidiaries of PATRON BERHAD (a pseudonym) that was incorporated on 23 July 1997. Case A is based at the PATRON Petroleum Industry Complex (PPIC) in Kerteh, Terengganu, Malaysia. Case A is well known as the main producer of ammonia and syngas in the Asian region. With regard to ERP systems, Case A uses SAP (Systems Application and Products in Data Processing). Qualitative data were collected by using face-to-face interviews with nine (9) participants from the four departments. The data were collected for two weeks from 2 July to 15 July 2009. From a total number of 9 interviews, two were conducted in Bahasa Malaysia (Malay Language). Each interview lasted between 1 hour to 1 ½ hours. The interview questions were open ended in nature with additional questions expanding on emerging themes. Table 1 below provides a Summary of Interviewees' Profile.

Table 1. A Summary of Interviewees Profile

Department	Participants	Participants Codes	Years of ERP Usage Experience
Finance and Planning	Manager	Mp1	11 years
	Executive	Ep2	8 years
Engineering and Services	Senior Manager	Mp3	11 years
	Executive 1	Ep4	9 years
	Executive 2	Ep5	5 years
Supply Chain Management	Senior Manager	Mp6	10 years
	Executive 1	Ep7	9 years
	Buyer	Bp8	3 years
Operating Performance & Improvement	Executive	Ep9	4 years

Data analysis was performed using the open-ended approach proposed by Strauss and Corbin (1998). We start with the transcription of the interviews. Since the interviews were conducted in mixed language (English and Bahasa Malaysia), the data was translated into English. This process carried out to facilitate the analysis process as well as to provide consistency in data transcription. By using the open coding, categories along with their

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properties and dimension extracted from the raw data. The process of coding is an iterative process where we detect the expressive statement in data and form the relation between these. Additionally, it is also appropriate to revise some coding categories during the analysis stage, which require us to revisit the data that that already coded.

4.   RESULTS

4.1   End User Usage Issues of ERP System

From the 21 survey questions, more than 50% questions associated with users' experiences with SAP. Three questions were asked on data issues, three questions were on SAP functionalities, four questions were related to the impact of the ERP system and one question was associated with ERP system benefits. For the interviews, there were two different set of questions: manager and end user. For the first set (manager), a total of 18 questions were asked. While the first four questions related to the demographic profile, the remaining 16 questions were on problems that a manager faces with ERP and how they handle usage problems. Two questions specifically related to usage problems. Five questions were on coping mechanisms and the rest of the questions were general questions pertaining to control, customization and upgrading. The second set of interview protocol for the end user consisted of 12 questions. Two questions were on the user's background, four questions were asked on their experience with the technology used in the company and two questions were on their SAP experience. One question was asked specifically on problems encountered by the participants (Q9) and the remaining three questions were on coping mechanisms.

The results of the exploratory survey suggested several benefits from SAP system use in Case A. The majority of survey participants perceived that SAP provides control over their work (79%). Most of the participants also agreed that data pulled out of SAP is accurate and reliable (69%). In addition, the SAP system enabled users to speed up task processing time (70%). SAP was also viewed as an integrated system that manages to support the business processes of the respective departments (80%). These findings are aligned with prior studies on ERP system benefits that include improvement in the accuracy and speed of transaction processing (T. H. Davenport, Harris, & Cantrell, 2004), accurate financial reports (Colmenaresc, 2009) and business process improvements (Peng, Schroeder, & Shah, 2008). Despite the system's advantages, it is interesting to note that 53% of the participants believed that the employment of the SAP system has not completely eliminated the use or development of departmental or end-user specific systems. This indicates their reliance on alternative systems to deal with the limitations of the formally sanctioned system (ERP). Further analysis of the nine interviews and exploratory survey revealed that users encountered system, data and interface issues. Table 2 below, illustrates a summary of the SAP (ERP) usage problems and a sample of the Interview logs.

Table 2. A Summary of Interview Logs on the SAP (ERP) Usage Problems

Category	Dimension/ Definition	Sample Interview Logs	No of Similar Quotes
System Functionality	Unavailability Lack of SAP functionality to perform a required task in a timely way (based on ISO EC 9126)	*"It is quite difficult to locate some reports directly from SAP system. For example, I require the customized report related to brand name and the damage cost from the maintenance cost report, but I could not get it from SAP. Similarly, if I just wanted to know the top ten maintenance bad actor, but it gives me headaches to go through all irrelevant report from SAP."* [Mp3]	7
System Usability	Underutilization SAP features have not been fully exploited by SAP users (Jasperson, Carter, & Zmud, 2005)	*"We have not fully explored some of the functionalities that reside in SAP. We have invested a lot for this system, yet, I feel that we are not taking advantages out of it. I would say that we may only utilize less than 60% of the overall system functionalities."* [Mp6]	5
Incompleteness of Data	Omission of or missing data entered into SAP ((Ballou & Pazer, 1985)	*"The data that I gathered from SAP sometimes is not complete. For instance, I need to retrieve total of Purchase Order for the month, but the required data is not there. When I run some of the reports, the detail order description is not captured. Later when I print another report that has the order description, it does not have the delivery detail. So I need to run several report code and combine*	2

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		them….. It is a waste of time." [Bp8]	
Interface	SAP's screen has not been designed in an attractive way for SAP users	*"The problem of the present SAP system layout is the inability to simplify the steps, retrieving and evaluating certain information that we want. If we want to get certain things, we have to go through few and longer steps. This is sometimes quite tedious, but if we have a simplified and favourite button like at the ATM bank, you can just click the favourite icon and the item will appear automatically."* [Ep9]	5

Unavailability of essential SAP functions was cited as one of the major SAP problem areas. This problem is particularly prevalent in regard to the reporting and analysis functions of SAP. A number of interviewees stated that because of SAP's limited reporting layout and functionality, they pull out the information from SAP and generate reports through Microsoft Excel or Microsoft Project. To quote from a Manager of the Supply Chain Management department: *"The data is already available from SAP, yet in terms of reporting, it was not able to cater the graphical presentation of report layout that was required by the management team".* [Mp6] Moreover, the findings demonstrated a typical problem of locating and generating customised reports: *"It is quite difficult to locate some reports directly from SAP system. For example, I require the customised report related to brand name and the damage cost from the maintenance cost report, but SAP would not generate the detail report. Similarly, if I just wanted to know the top ten maintenance bad actor, but it gives me headaches to go through all irrelevant report from SAP."* [Mp3]

The survey findings strengthened the interview results, where more than half of those surveyed (59%) agreed that SAP is not effective in generating customised reports for management. Therefore, the majority of respondents (80%) regularly pull data out of SAP and transform it into Microsoft Excel format for report generation, and about two-thirds of the respondents (67%) use an Access database or Excel spread sheet to overcome SAP limitations. Despite that, 67% of those who responded felt SAP is an effective system in providing a method for manipulating data relevant to their job requirements. More than half (59%) of the survey respondents believed that SAP is not effective in generating customised report for management. Further, only 56% believed that SAP provides information and functionalities that meet the needs of the department, and about two-thirds of the respondents (67%) used an Access database or Excel spread sheet to overcome SAP limitations. For example, the absence of tracing capabilities from the inventory management function resulted in the use of an alternative system, known as TREMA. This system was created by PATRON BHD for the purpose of setting up the inventory parameters and deciding how much inventory should be kept in one particular period. This is the sanctioned system created internally and thus it was not considered a feral information system. Such as from a statement by a Supply Chain Management Executive: *"Some of our required functionalities are not available [in SAP]. We do face some problems concerning our Inventory Management. Say for the material A, we need to know the consumption detail based on its movement…. the amount involved and the consumption date, how much we need to purchase for further usage… So, we observe the consumption pattern of the material for 5 years and propose the required amount of stock needed for setting the appropriate inventory parameter. Unfortunately, at this stage, this function is not yet available in SAP."* [Ep7]

SAP is indeed a very powerful system, yet end users have not really optimized it due to various reasons such as the lack of customized functionalities. In order to use SAP functionalities, it should be customized to users' requirements. However, due to the cost constraint in Case A, some of the customized functionalities were not made available to SAP users. An executive from the Operating Performance and Improvement department (Ep9) opined: *"Although the modules in SAP are there, you still need to customize the function to suit with our needs. On the other hand, when we talk about customization, no doubt it involves additional costs. As we are aware that to implement the SAP system alone is really costly, by adding the customization, it will definitely incur an additional cost. These are apart from the ID cost. At present, the cost for user ID is AUD1330 (RM4000) per year, at present we have 210 staff and everyone needs to have the ID, and so can you imagine how much cost is involved? Of course, if we wanted to use more SAP features, the additional cost would incur."* [Ep9].
In terms of system underutilisation, some of the SAP system functionalities are not fully exploited. For example, the executive from the Finance and Planning Department highlighted, *"we are not familiar with many SAP features and this restricts us from utilising the system…. one more thing, we have to eliminate the island system in order to utilise SAP.'* [Ep2] In another example, a system underutilisation problem was highlighted by a senior manager of the Engineering and Services Department [Mp3]: *"From my observation, we have invested a lot for SAP but our users are not really utilising it. I could say the utilisation rate could be around 50% to 60%".*

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Another SAP usage problem revealed in Case A is the SAP interface. The interface problems include poor screen display, navigation and access to information, and poor system output. Some of the participants pointed out the considerable amount of effort needed to navigate a simple transaction. This is especially felt by novice users. An executive from the Engineering and Service Department described his own experience: '*Knowing the transaction code is essential to execute any transactions...because it would take us several routes just to get to our desired screen....this is what I have experienced before.*' [Ep4]. The view supported by an executive from the Finance and Planning Department following his remark: *"I have to spend quite some time to familiarise myself with the full functionality of the interface. The interface was so unexciting to use and it is not user friendly too"* [Ep2]. In addition, interface problems are also manifested in difficulty in interpreting and understanding SAP system output. This problem was reported by a number of respondents. To cite an example from an executive of the Engineering and Services Department: *"I have experienced difficulty especially during my early days as an SAP user. I hardly understand the report from SAP; it does not have a lot of flexibility. It does not give me the information that I need...furthermore, it makes my work more difficult."* [Ep5]

The survey finding suggested that although users believe that SAP is effective for accessing (73.%) and processing (67%) data, a couple of SAP users suffered data incompleteness problems and were unable to generate customised monthly Purchase Order Reports. This was because the information required by the users (description, delivery detail) needs to be retrieved from separate SAP report codes. The combined data are then transferred to Excel to cater for the users' needs. This is consistent with the survey response where 69% of respondents believed that the data they pull out of SAP is always accurate and reliable. However, a small number of those surveyed rely heavily on manual records that they have created themselves (34%) or have been created by others (23%) outside the SAP environment.

4.1   Users' Experiences in Coping with ERP System Issues

In addition to the ERP end user usage problems, the exploratory study also attempted to discover the coping mechanisms employed by end users in dealing with ERP system shortcomings. The review of previous studies revealed how users would find ways to deal with information system problems. Among the identified coping mechanisms were improvisation (Monteiro et al., 2012), ignore or disregard the problem (Benamati & Lederer, 2001) and abandonment (discontinue using ERP). However, since ERP is a mandatory system (see, e.g. (Brown & Lockett, 2004), end users do not have the option of discontinuing using the system or switching to a new system (DeLone & McLean, 2003). Thus, an exploratory study was carried out to explore the other coping mechanisms employed by end users.

Results from the exploratory study revealed the widespread use of alternative systems by SAP users in Case A. One result was that 53% of those who were interviewed indicated that the implementation of the SAP system was unable to fully eliminate the used or creation of alternative systems, despite the fact that 61% of the total participants agreed that SAP system difficulties did not contribute to the employment of alternative systems. Additionally, Microsoft Excel and Access were frequently cited as major options to deal with the limitations of the formally sanctioned system (SAP). Further, more than two-thirds of the participants (71%) agreed that they rely heavily on e-mail and faxes rather than SAP functionalities to communicate workflows. The interview and survey results from the exploratory study suggest the use of a 'feral system' as a major coping mechanism employed by end users in Case A. The 'feral system' comprises feral use of information technology and feral information systems. The following section discusses these mechanisms.

Feral Use of Information Technology

Feral use of information technology signifies the use of various standard software applications such as Microsoft Excel and Project or in-house databases to overcome some limitations of the formally sanctioned system (SAP). A number of instances of using Microsoft Excel to cope with the unavailability of ERP functions for the preparation of customised reports were found, as the standard reporting functionality of the ERP system (SAP in this case) was mentioned to be quite poor. Although sometimes some of the reports taken directly out of SAP give all the information that is needed, the layout and format are not in accordance with management needs. An executive from the Supply Chain Management Department highlighted: *"To accommodate the [reporting needs of managers] ... I download the data from the system, add the necessary details like Purchase Order with detail description and prepare the report in Excel."* [Ep4].

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Likewise, in the Finance and Planning Department, Microsoft Excel is used for costing and evaluation reporting. The senior manager of the Finance and Planning Department recaps: *"For our costing, which again, we have a specific reason for not using SAP. This is because the similar function from SAP is expensive. However, the data created in Excel will be uploaded into the system. It is more on the system automation for the calculation of our costing. Somehow, all of the required formula is already there [Excel template], so we just plug in the new number and get our desired outcome."* [Ep1]. In another example, Excel is used to bypass calculating deferred taxation using SAP and to revert back to old practices of manual calculations. An executive from the Finance and Planning Department explained: *"We have some issues concerning the tax computation. When we do it, we have to do it correctly in the repair maintenance account codes. Say when we create the Purchase Order that requires us to fill up the tax detail; some of us tend to ignore it. The problem instigated when we generate the report from SAP as it is meaningless."* [Ep2].

The survey findings confirmed the interview results as 80% of survey respondents regularly pull out data from the SAP system and transfer them to Excel for the purpose of report generation. Nonetheless, only 31% regularly update the data kept in the Microsoft Excel files. When the participants were asked why they opt for Excel spread sheets instead of configuring the SAP system functions, more than two-thirds of the total respondents (67%) highlighted that the use of this alternative software was in order to overcome SAP system deficiencies. Working outside SAP with Excel suggests the possibility of a fictitious picture of the company inherited from changing the data. Thus, it leads to data quality issues that have been reported earlier.

Microsoft Project is also used to cope with the ERP problems end users encounter. One such instance is the use of Microsoft Project for planning, which was highlighted by an executive from the Engineering and Services Department. Since he is responsible for planning manpower for projects, he prefers Microsoft Project due to the graphical presentation functionality that it offers: *By using this system [SAP], we manage to group the task according to its group or category. "Yet, I require more general planning. So, through Microsoft Project, I am able to create schedule via the Gantt chart in order to estimate the completion task of each project."* [Ep4].

Overall, although it was observed that users rely on the ERP system, results from the survey indicate that nearly half of the total respondents (46%) still depend on these standard software programs (Microsoft Excel, Project and Access) for better control of their work despite their duplication of some of the ERP system functionalities. Nevertheless, 74% of the respondents stressed that their department or work unit did not use a system which has similar functionalities to SAP. In addition to that, more than half of the respondents (56%) disagreed on the use of other systems to overcome SAP system deficiencies. Another example of alternative mechanisms used in coping with the SAP system limitations is through the Lotus databases. According to an executive from the Supply Chain Management Department [Ep6], some of his staff was still relying on Lotus databases for data storage. He acknowledged that familiarity with the present Lotus database was the reason they were reluctant to shift to the integrated system (SAP): *"They were already comfortable with Lotus database, as they have been using it for quite some time."*

Feral Information Systems

Apart from the use of feral information technology, a system known as Web Based Interface, developed by the other subsidiary of PATRON BHD, is used in Case A. This system is based on the Microsoft.NET application (Microsoft dot net application). It is designed to extract data from SAP and store this data (SAP) in the company's network drive. Since there is a possibility that end users are unable to get their desired result from SAP, this system is employed as an alternative database. The introduction of this application is intended to support the SAP system in generating customised reports. The following quotes show how this application is used in Case A: *"There is software which is developed in-house by one of our staffs in the other subsidiary of PATRON BERHAD in Kedah. He did some programming in Microsoft. NET application whereby we do not need to go through SAP any more...but then, the software [Web Based Interface] is just a medium to extract the data from SAP daily and stored in company's network drive and everybody can just view from there."*[Ep2]. A comment from another respondent corresponds with the above statement on the Web Based Interface: *"As the SAP interface is not user friendly, there is a tendency that SAP end users are unable to get the desired report...That is why having an alternative for another interface..... We call it Web Based Interface."* [Ep6]

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5. DISCUSSION OF END USERS' PROBLEMS AND USE OF A FERAL SYSTEM AS A COPING MECHANISM AND IMPLICATION

The end users' problems refer to the ERP usage problems faced by end users during the post-implementation phase. It is apparent from the empirical evidence that end user problems are mainly associated with the unavailability of functionalities, the underutilisation of system functions and interface issues. The incompleteness of SAP data is the least cited problem by end users. Unavailability of functions: Ideally, the ERP system should be able to provide functionalities that match end users' task requirements, in terms of users' understanding of what the functions offer and how they would assist them in performing their tasks (Faisal, Faridi, & Javed, 2011). However, one of the problematic ERP usage issue is the unavailability of some functionalities needed by end users. Since the ERP system was designed to meet the needs of broad classes of businesses, rather than to specifically meet the particular needs of an individual business (Holsapple, Wang, & Wu, 2006), the unavailability of some of the functions users require is unavoidable. Thus, customisation of the ERP system is crucial to cater for the gap between users' needs and what the system provides (Kanchymalay et al., 2013; Themistocleous, Zahir Irani, & O'Keefe, 2001).

System underutilisation: An individual user's usage behaviour is critical in understanding the post-adoptive use of IS and maximising an organisation's use of technology (Jasperson et al., 2005). The more useful and the easier it is to use a system to enable employees to accomplish their tasks, the more it will be used by end users (Kwahk, 2013). Yet system underutilisation persists to slow down the ERP system usage as the underuse of system features may prevent organisations from fully realising the promised benefits of the installed IS (ERP) technologies (Davenport, 1998; Rice & Cooper, 2010).

Interface is one of the problems reported from the exploratory study. Interfaces are designed to aid users' understanding of the system (Wang, Liao, & Chu, 2011). The ERP system's complexity resides in the 'unfriendly' nature of the interface (Arasanmi et al., 2013; Boudreau, 2003) which results in poor usability (Singh & Wesson, 2009). Thus, it is essential to have a user friendly and easy navigation interface since complicated interface designs are more likely to increase users' frustration and anxiety in using the system (Arasanmi et al., 2013). Poor interface design can lead to repeated data entry that is costly and time consuming and would inevitably lead to inefficiencies that affect the ability of an organisation to compete effectively in the marketplace (Trimi, Lee, Olson, & Erickson, 2005).
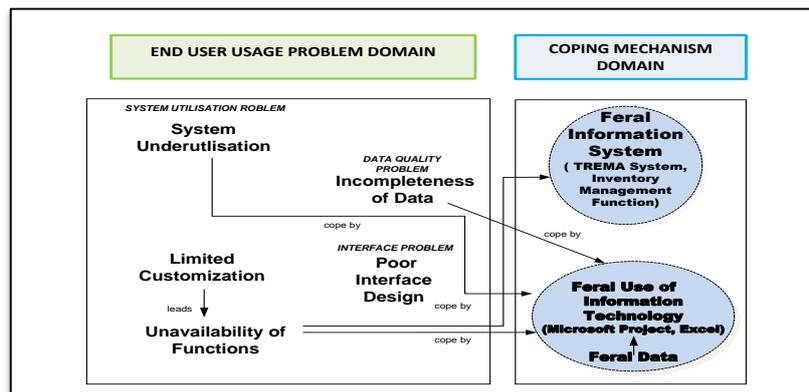

Fig. 1. A model of ERP (SAP) usage problems and Feral system as Coping Mechanism

The analysis of the findings of the exploratory study also revealed that users rely on the use of standard software applications (such as Microsoft Excel, Project and Access, and other information systems) as one of their coping mechanisms, to work around the rigidity and limitations of the ERP system structures. The two main forms of this coping mechanism strategy discovered were Feral Use of Information Technology and Feral Information System. The findings from the exploratory study encapsulates in the form of a model of ERP (SAP) usage problems and feral system as coping mechanism (Figure 1).

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5.1 Implications of the Exploratory Study and Lesson Learnt

The exploratory study was useful in providing some insight into users' experiences pertaining to SAP problems and the coping mechanisms employed in dealing with the problems. The lessons learnt from the exploratory study had important implications as specified below:

- The exploratory study provides empirical evidence that users experience some problems with system (unavailability of essential function), data and interface. In addition, it shows that the SAP system is underutilised. These findings lead to the interrelation between the usage issue and coping mechanism of ERP system usage problems.

- To cope with system problems, users rely on standard software such as Microsoft Excel, Microsoft Project and Microsoft Access, which are considered important tools for patching flaws in the integrated system. The application of these standard programs as coping mechanisms can be seen under the 'feral system' concept. The feral system concept was introduced in prior studies (Houghton & Kerr, 2006; Spierings et al., 2012) to explain why a user or group of users develops an information system, uses information technology or inputs data to circumvent an organisational information system. Hence, lend to the formulation a model of ERP (SAP) usage problems and feral system as coping mechanism.

- Although the use of a feral system concept is likely to circumvent the functionality of a formally sanctioned system, in the present research, a feral system is intended to be a coping strategy, in line with studies that recognise that feral systems are used to deal with the drawbacks of ERP.

From the practical point of view, this paper could assist managers in reaching the sources of problems encountered by the end-user. Thus, the paper facilitates overcoming these problems. Managers as well as other practitioners should anticipate possible problem and assess the potential threat to their respective project. Knowing and identifying the problem alone is not sufficient to address the various problems that hinder the effective usage of ERP system. Therefore, the practical implication of this paper would also include on how managers recognise the various coping mechanism such as request for the improvement, workaround, supplement the systems or even develop a feral system. In a way, this paper could facilitate managers to recognise the 'feral system phenomenon' that might influence the use of ERP system in the organisation either in a positive or negative manner.

The research has some limitation. Since the research was conducted in an organisation in Malaysia, with a unique organisational culture and some special characteristics, the result might not hold true in other organisations and environment. A similar study should be conducted using a broad and diverse sample from other countries to further extend and enhance these findings. Additionally, the model of ERP usage problem and feral system is derived from a single case study. Therefore, more research is needed to validate and extend the proposed model. More research is crucial to study the causal factors of end user problems. For instance, a longitudinal qualitative research should be carried out to investigate the relationship between the identified problems with the causes of the problem. In addition, further study may also highlight the other nature of control mechanism used by the organisation in order to overcome this problem. This is because by knowing and identifying the problem alone is not sufficient to address the various problems that hinder the effective usage of ERP system. Therefore, future study could include on how managers recognise the various coping mechanism besides feral system.

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