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The Deployment of Service Management Systems in SMEs – Three Case Studies

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***Abstract*—Service management is a new and emerging software niche, which is still relatively unexplored by many companies. This paper examines the service management process in three small to medium sized enterprises in the UK Midlands region, and the software systems that support the process. The paper provides a top-line analysis of the degree of fit between process and technology support, and concludes with some observations on service management as a process and systems concept.**

Keywords - service management, SMEs, information systems, process change, case studies

I. INTRODUCTION

Service management is a relatively new concept as regards business information systems. Only recently has it emerged as a separate software module, either as a specialist standalone offering (such as Solavista) or as a module in an integrated ERP package, such as SAP. Service management can be defined as "monitoring and optimizing a service to ensure that it meets the critical outcomes the customer values and stakeholders want to provide" [1]. Service management has also been seen as "comprised of software, services and knowledge that assist companies in efficiently delivering service commitments" [2]. Software vendors suggest that systems can cover a range of functions related to service scheduling, delivery and monitoring. One software provider asserts that service management systems are "designed for companies that market, sell, service and support equipment and/or assets or provide professional services. They start working from the point of initial lead/opportunity, through quotation/estimate, order processing, installation/ commissioning, servicing and maintenance to equipment/asset retirement and replacement" [3].

Before the advent of these software packages, systems users either had to adapt other packaged software to embrace the required functions as best they could, or bespoke in-house systems to cover these requirements. One such example of the latter was the Keg Information Management system (KIMS) developed at cider-maker HP Bulmer in the early 1990s. The company was migrating its systems to the Oracle ERP product, but this software, from one of the World's leading suppliers, did not provide the required functionality to support the scheduling and installation of bar top cider fonts and cider dispense equipment in the pubs and clubs around the country. This early example of a bespoke service management system exhibited many of the features of later packaged solutions. Bloor [4] noted in 1993:

"The keg equipment installed in these outlets represents a major investment for Bulmer, and its installation and repair is the responsibility of some 40 field based technicians. Their movements are initiated by telephone calls from clients requiring service, followed by scheduling at a single, central point of service, and communication of the schedules to the technicians in the field by telephone from a central office. The technicians then record the equipment and its location at the site and provide other information for service reporting. As an added bonus, the technicians also note other information relating to the sites visited; qualitative information, such as type of pub and clientele, presence of a restaurant etc., which is all useful for formulating new marketing and business plans and planning new sales campaigns".

In this early example of a service management system (SMS), we can see the main functional elements that are evident in today's SMS packaged software modules. In essence these are:

- The scheduling of the delivery and/or installation of goods, services or contract work.
- The scheduling of human resources to undertake tasks related to those goods or services (installation, repair, maintenance, product upgrades, contract staff, project management)
- The processing of requests and inquiries from customers relating to the above mentioned goods and services.
- The two way exchange of marketing, sales and operational information between the customer and company personnel (located either on the customer site or at head office).
- Reporting of management and operational information on financial value of assets, call-out rates, problem resolution performance etc.

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It is these basic functions that constitute the core of today's SMS software, complemented by current data transfer and communications technology. It is worth making clear here that SMS as a concept in this paper is distinct from the concept of 'service' as used in the context of service-oriented architecture (SOA), which is a technology design concept concerned with the way in which new systems are developed and integrated. Brown, Johnston, and Kelly [5] have defined SOA as "a way of designing a software system to provide services to either end-user applications or other services through published and discoverable interfaces". There is, therefore, very little overlap with SMS as used in this paper, other than that SOA could be used as a design principle for developing SMS software.

The three SMEs studied in this research are located in the Midlands counties of Hereford and Gloucestershire. They are all of approximately the same size, having turnover of between £2.5 and £4.5m and staff numbers of 35 – 50. They are in three distinct industry sectors, all of which embody significant service management activities.

TPG DisableAids is a provider of equipment for the elderly and disabled and has grown steadily since its foundation in 1984 to employ 47 staff today. The company assembles and distributes a wide range of products from primary manufacturers, such as Stannah, who make a range of stair lift products. The company currently has an annual turnover of £4.3m (2009/10), with stair lift products generating about one-third of turnover but over 50% of profits.

TPG DisableAids' market can be divided into different segments (NHS, local authorities, district councils, residential & nursing homes, private individuals). Their business plan is to double their turnover within 5 years to £8.5m in 2014/15 which is dependent on the company having the systems capability to respond to the equipment and service requirements of the NHS and related bodies, as well as private individuals, at short notice as the elderly and disabled leave hospital and return to their homes. Service management processes and systems are key to achieving this turnover growth and increase in market share.

Optimum Consultancy Ltd was formed in 2008 through the merger of two companies - Hama Ltd, a project management services business, and J Orchard Consulting Ltd, a surveying services business. In its first trading year (2008-9) it achieved a turnover of £2.4m and this was increased to £3.1m in 2009-10. The company has 35 staff and its core business remains project and cost management in the property, engineering and construction fields; its customer base includes major retailers, rail operators, major financial and banking corporations and sustainable developments. The merger of the two companies posed significant challenges to combine and upgrade two different IT/IS architectures and in particular to align and standardise the customer facing processes and systems across three offices. In 2009-10, new integrated systems and customer facing processes were introduced to provide the infrastructure support needed for steady growth and improved margins, without the stop-start addition of administrative overheads. The systems strategy revolved around the Workspace integrated package (from Union Square software) and a major output was a new process and associated procedures for responding in a consistent and streamlined manner to customer enquiries, across the organization. This encompassed a review and evaluation of how Optimum's services and products could best be combined and supported to meet varying customer needs and improve customer service.

Muddy Boots Software Ltd (MBS) is a rapidly expanding software house and the company's business plan targets a trebling of turnover within 5 years from £1.6m in 2009 to £6.0m in 2014. The company has three main software products that are the main drivers of revenue growth in the immediate future (Quickfire, Greenlight and CropWalker). A strategic component of this growth is the implementation of customer centric systems and processes to drive and support new sales both in the UK and in overseas markets. A recent IS project has attempted to embed a new sales and marketing culture within the company based on the Microsoft CRM package and re-engineered supply chain and service management processes. MBS is moving from a mainly UK customer base to an international user base. This is supported by additional offices abroad and systems which can be accessible from multiple locations and time zones to enable a variety of services and support to be provided 'anytime, anywhere, any place'.

The paper is divided into five main sections. Following this introduction, section two reviews literature pertinent to the related themes of process change and alignment and the emergence of packaged software. The case study methodology is then briefly discussed in section three, followed by an overview of findings from the three case studies. Finally, in section five, some concluding remarks are made about the emergence of service management as a core business process and mainstream software package.

II. LITERATURE REVIEW

In this section, literature relating to the emergence of process thinking is discussed, leading to consideration of the parallel growth of business packaged software since the early 1990s. The concept of strategic alignment is then briefly examined in the context of process improvement and IS strategy development.

A. Process versus Function

Many companies want to organize themselves around processes but they do not have any clear idea which steps to follow and which initiatives need to be taken. Others are not sure how to structure a company around processes and sometimes turn to consultancy to help them decide what to

do. There are also companies that are not sure whether their current organizational structure is adequate to engage process management. Earl [6] discusses how business processes can be improved by deploying new information systems. This paper focuses on in depth case studies at the three companies noted above, all of which have invested in information systems to support the service management process, in order to drive business expansion.

Companies sometimes find it problematic to adequately embrace process management especially when the organization is dominated by traditional functional structures. Organizations structured by task and function need to be redesigned to work by process. Some companies tend to take a few steps and give up without knowing how to progress. The difficulties stem from a poor understanding of the concept of process. Ramaswamy [7] suggests that companies that provide services normally think that process is a sequence of activities needed to perform transactions that help to provide their services.

To organize a company around business processes, it is necessary to focus on external customers because business processes usually start and end with them. Processes are a series of activities which begins with an exact understanding of what the external customer wishes and finishes with the external customer gaining what he/she needs and requests. The customer is always central within organizations structured by process and the final objective of these companies is to offer to the customer more value in less time and with less cost. Organizations are in a battle to achieve it and they are learning to think in new ways to structure the company accordingly.

To define processes is a difficult task, which involves many complex factors like customers, human behavior and company structure. However, process modeling can provide a less detailed way to define process. It has been suggested that "the task of modeling, in general, aims to provide, an abstract description of one slice of reality by omitting details and thus reducing complexity which is usually inherent in real world situations" [8]. In practice, functional areas do not disappear when companies organize themselves around processes. When process owners assume their responsibilities for specific projects, with related structure and process roles, the functional area bosses are left to focus on staff training and resource planning and management.

B. Business Packaged Software

Packaged software for most mainstream business processes came to market in the 1990s as the spread of the UNIX operating system as a *de facto* standard for mini computers and the increasing dominance of the Intel chipset led to a massive surge in the packaged software market. Building on the earlier Materials Requirements Planning (MRP) packages, other packaged software systems provided modules for sales order processing, ledgers, payroll and personnel as well as MRP, sometimes combined into one integrated package from one vendor – for example, the ERP software suites of Oracle and SAP. The increased take-up of packaged software coincided with the spread of business process re-engineering (BPR) as a management concept employed by many companies to improve efficiencies and reduce overheads. The two became closely linked as BPR projects were frequently combined with the introduction of new software solutions.

Only in recent years, however, has the concept of service management as a separate software module been clearly identified as a component of an integrated ERP solution or as a standalone solution as part of a 'best of breed' IS strategy. There is an on-going debate regarding whether 'best of breed' or 'one integrated package' (ERP) is the optimum solution for SMEs. Robinson [9] questions "if a company has, for instance, a financial package they are happy with, should they dump this and use the integrated package? The answer to this question is a definite 'yes'. If a fully integrated package is right for the company, the people using stand alone systems must be trained in the use of the integrated system so that all the stand alone systems, databases and spreadsheets can be dumped. Not only will islands of data reduce the advantages of the integrated system but it will also undermine its integrity".

C. Strategic Alignment and Process Improvement

Many of the theories and models of information systems strategy development are based on a logical progression from business strategy to evaluation of information requirements, leading to an information system (IS) strategy. Process analysis, producing 'current' and 'new' process maps, also features in some IS strategy development models; and data analysis and data modeling can also play an important role in determining what systems are required. Robson [10] suggests an information strategy is also appropriate.

Levy and Powell [11] have identified competitiveness and the importance of customer power in determining the way SMEs use IS, and they conclude that "a major barrier to the use of IS to support innovation is the leadership and technical knowledge of the owner and/or management team". Alignment of IS Strategy with overall business strategy is key. Koopman [12] supports this perspective in asserting that "the real threat to most companies is not a strategic threat from outside. Instead it is their own failure to align their organization with their strategy and thus ensure good execution". An organization must be able to align itself with the strategic plan and turn strategy into action.

As noted above, BPR is often regarded as a route to gaining the combined benefits of new information systems and process redesign and improvement. "BPR is the means by which an organization can achieve radical change in performance as measured by cost, cycle time, service, and quality, by the application of a variety of tools and techniques that focus on the business as a set of related customer-oriented core business processes rather than a set of organizational functions" [13]. Short and Venkatraman

[14] suggest that BPR has in the past largely had an internal, operational focus. The objective has usually been the optimization of a single process rather than transformation of the enterprise itself.

III. RESEARCH QUESTIONS AND METHODOLOGY

Service management is a key activity in all three SMEs studied in this paper, even though it is recognized as a core process in only one of the three (TPG DisableAids). This paper aims to answer three research questions:

- What is the service management process in these three SMEs? Are there major differences or is the process essentially the same in these companies that operate in three different industry sectors?
- What information systems and support technologies are used to support the service management process?
- How effective are these systems and are they well matched to the specific requirements of service management in each company?

A. Research Method

Saunders, Lewis, and Thornhill [15] highlight that qualitative and inductive research can be done in different ways encompassing case studies, grounded theory, and ethnography. Remenyi, Williams, Money, and Swartz [16] agree that case studies are likely to be used as part of an inductive research approach. Cassell and Symon [17] define case study research as a "detailed investigation … of one or more organizations, or groups within organizations, with a view to providing an analysis of the context and processes involved in the phenomenon under study". The research method employed here is case study research of SMS systems implementations in three SMEs.

The evaluation of results was done comparing the answers given in questionnaires with observations made by the authors. This was analyzed in conjunction with the findings of a literature review, allowing empirical generalizations and a series of clear statements to be developed.

B. Data Collection Methods

There are several ways to collect qualitative data that have a case study research focus. Examples include questionnaires, interviews and observation. After carefully analyzing data collection methods, questionnaires and observation, combined with first hand interviews, were elected as the most suitable approaches for data collection due to the presence of the authors as consultants to the companies over a period of years.

Wu, Mahajan, and Balasubramanian [18] suggest that subjects must be in a position to generalize about business behavior. Only employees at the level of manager/supervisor or higher were considered for participation in the study. All responses were complemented by face to face interviews. In addition, at least one year of observations were also documented by the authors in each of the three companies, which helped the research by highlighting facts that were not gathered in the interviews.

TABLE 1. SERVICE MANAGEMENT ACTIVITIES AT THE THREE CASE STUDY COMPANIES

Five main service management activities	Case Study Response
1.Scheduling of goods and services	TPG - YES OCL – YES MBS - YES
2. Scheduling of human resources	TPG - YES OCL – YES MBS - YES
3. Processing of customer requests, enquiries, and cost estimates	TPG - YES OCL – YES MBS - YES
4. Exchange of sales, marketing and operational information	TPG – LIMITED OCL – YES MBS - YES
5. Management and operational reporting	TPG - YES OCL – YES MBS - YES

IV. FINDINGS

This section reports on the detailed findings from the questionnaire responses, personal observation and follow-up interviews in each of the three companies studied, looking at processes, systems and then functionality and integration issues.

A. The Service Management Process in the Case Study Companies

Questionnaire responses revealed interesting differences in how the three companies perceived service management. At TPG, service management was seen as one of the company's main business processes, closely linked to route planning and scheduling (for the company's 20 field based service engineers) and marketing and selling (Fig. 1). At OCL, however, service management was not seen as a distinct process, but rather as part of three other processes - business development, people management and operations management (Fig. 2). Similarly at MBS, service management is perceived as being a part of three main business processes – technical services, commercial services and sales and marketing (Fig. 3).

Nevertheless, all three companies are involved in the five main activities or functions that are generally covered by SMS and the constituent parts of the overall service management process (Table 1). Perhaps not surprisingly, given that the TPG management recognizes service management as a core process, the activity descriptions contained in the questionnaire response is somewhat richer than in the other two cases. For example, for the scheduling of goods and services, the respondent noted that "there are three administrators/clerks in the service department with roughly one third each of the geographic area we cover. Each has a team of engineers to manage and arrange

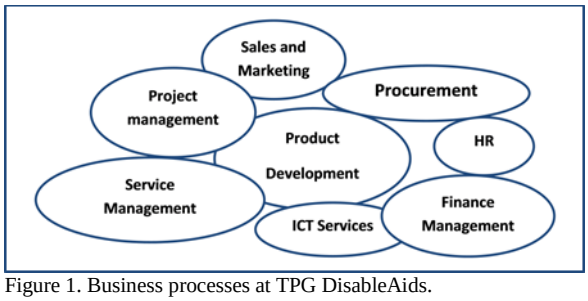

Figure 1. Business processes at TPG DisableAids.

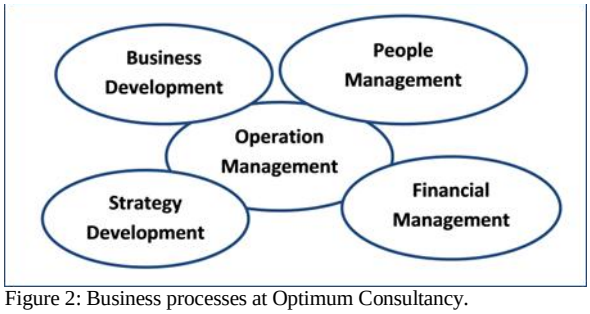

Figure 2: Business processes at Optimum Consultancy.

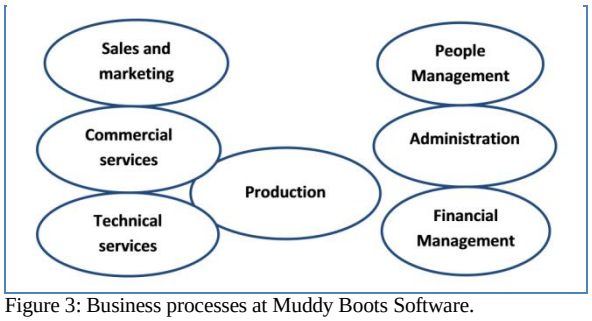

Figure 3: Business processes at Muddy Boots Software.

appointments for (a) scheduled installation of goods sold by the sales department (e.g., stair-lifts, hoists, etc.), (b) routine maintenance (e.g., 6 monthly service calls), (c) breakdowns (with response times being either same day, next day, 7 days, 14 days). Each month 'VSM' (the service management system) produces a list of all items that need to be serviced in that month. These are printed, split and allocated to each clerk. Appointments are made by agreement with either (a) a private customer on the phone, (b) with equipment owners where public sector organisations own the equipment. For breakdowns, each clerk may 'borrow' an engineer from another area" [19].

This activity description illustrates the type of specialist functionality that an SMS requires, combining call scheduling, stock management, field communications, field-based plant maintenance, customer management, and human resources scheduling. Indeed, as regards this last point, the respondent at TPG notes "delivery of goods not requiring expert engineering/installation personnel is undertaken by stores/warehouse…VSM contains all pending work and each clerk manages their own work in VSM and their own engineers" [19].

This contrasts with the process analysis at OCL where service management is not recognized as a core process. Nevertheless, the breakdown of main processes to activity level shows a range of functions that collectively may be seen, in part at least, as constituting the service management process – sales enquiry and tenders management, personnel management, project management, contacts management and marketing (Fig. 4). A similar picture emerges at MBS, where the service process activities are split across several main processes areas. Technical services and commercial services undertake activities such as the scheduling of human resources, the processing of customer requests, enquiries, and cost estimates, the scheduling of goods and services and the management and operational reporting. In addition the exchange of marketing and sales information is an activity carried out by the sales and marketing department and operational and management reporting also covers activities undertaken by the sales, marketing and finance departments.

B. Service Management Systems Deployed in the Case Study Companies

In all three companies, packaged software is deployed to support the main activities that make up the service management process (Table 2). At TPG, Vision Service Manager (VSM), from software house Sybiz, supports all these activities to some degree, although the perception is that this is only done moderately well – and that replacement will likely be required in the short to mid-term. This is partly because of the old FoxPro database technology that underpins the version of Sybiz used at TPG. The questionnaire respondent notes that "the entire software architecture and key processes are under review" [19].

At OCL, where the Workspace software package has recently been implemented, all main service management activities are seen as being well supported. Lau, Wynn, and Maryszczak [20] note that the system "allows the senior management team to track and manage the new work pipeline more easily. When Optimum wins a job, it is migrated to a project record form which holds all relevant history. Previously, as a job flowed through the Optimum business from enquiry to completion, it was recorded and tracked using spread sheets held on the network server. Staff spent a lot of time each month searching for or collating information relevant to a particular job. With the previous system, there was no way of sitting at one's PC and getting a complete picture of any particular job across the various systems. A lot of manual processes were required to bind together project data from the various applications and, furthermore, there was a lack of version control on these documents." This is interesting because Workspace is generally positioned as being in the 'collaboration management' software niche rather than a 'service management' package.

At MBS, the picture is less clear. The Technical Services Manager at MBS noted that Microsoft CRM was the key

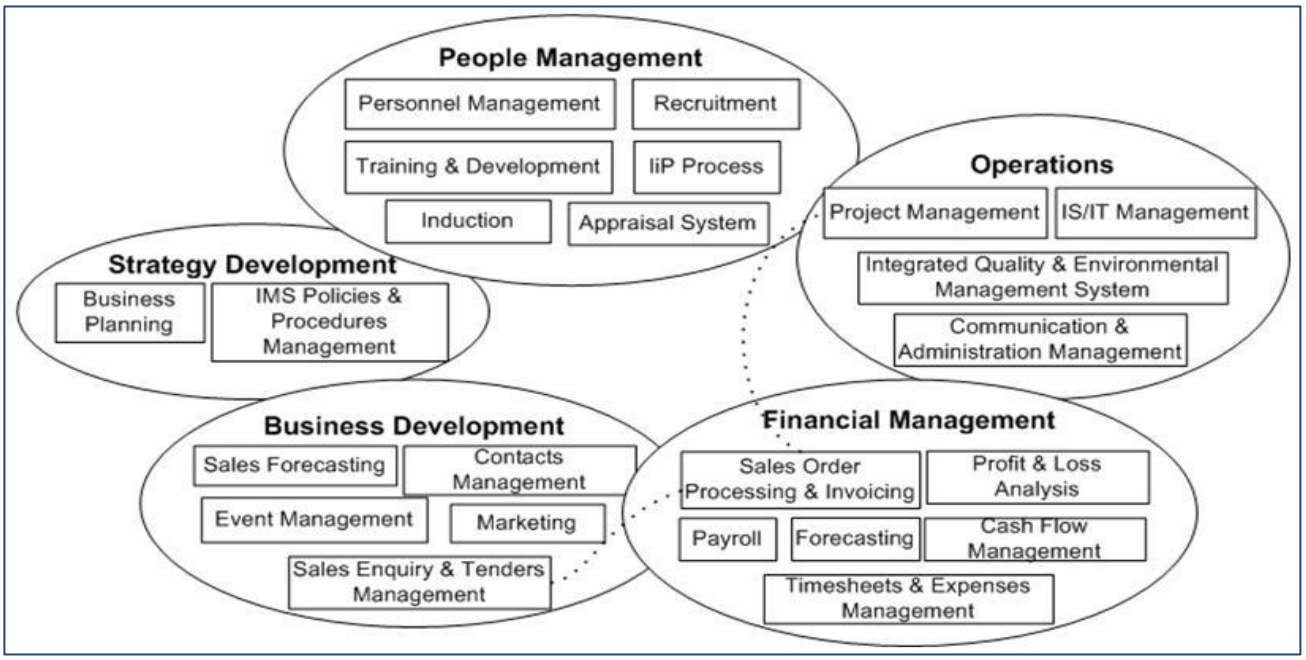

Figure 4 OCL processes broken down to activity level.

service management software in the company and is used alongside Microsoft Outlook with which it integrates. In addition, other departments that are involved in service management are using other packages (Microsoft TFS and a bespoke legacy system for timesheets), albeit in a lesser way to support this, with obvious disadvantages (no common point for service management or one-business view for reporting). "Microsoft CRM and Microsoft TFS have only recently been brought into use in this business and even though their capabilities are vast, they are not being fully utilised currently. Because service management is dispersed across several departments within the company and several systems are currently in use there are improvements to be made by integrating these systems more closely. Further work needs to be done to achieve this before the company grows further" [21].

It was felt that this situation was partly due to the introduction of new systems which take time to bed in. Thus a legacy system (such as the bespoke timesheet system) will be decommissioned when the new systems - Microsoft TFS and CRM - take over this functionality. When that occurs, these new systems can be integrated to give a one-business view of service management. The reason for multiple system use in service management at MBS can be related to the fact that this company does not view service management as a key standalone process. Consequently it is spread over several functional departments, each of which also has other activities to perform, and therefore departments have opted for systems which support their overall role rather than just service management. Overarching this is a top-down drive for business wide systems that will draw the constituent parts together through integration.

C. *Functionality and Integration Issues*

Table 2 reveals a mix of 'green' and 'amber' ratings for service management systems in the three companies. Respondents were asked to assess two main aspects – functionality (against requirements) and technical and integration issues. Understandably, it is at OCL that management are most satisfied as they have just recently implemented the integrated Workspace solution which covers the company's main service management requirements. At TPG, there are problems with all service management functions. As regards management information, the IT manager notes on the questionnaire that "report facilities within VSM are very poor. They are inaccurate and since the product does not have basic validation of data entered, most reports generate garbage. Additional software has had to be written to correct the data and report on that" [19].

However, he also highlights the benefits of integration: "Vision Service Manager (VSM) and Vision are written by the same supplier. The two products are 98% reliable in terms of integration but errors do occur and take a lot of time to correct". In conclusion, he asserts that "the entire software architecture and key processes are under review. Current systems do not cover all requirements" [19].

At MBS, as noted above, a number of different software products are used for service management activities due to service management being split across the main major business processes and therefore different activities are undertaken by different teams of staff. The majority of these are Microsoft products (TFS, Outlook and CRM) and it is thus possible to integrate them given enough resource. One additional package, a bespoke timesheet package, may not

TABLE 2. SYSTEMS DEPLOYED FOR SERVICE MANAGEMENT AT THE THREE CASE STUDY COMPANIES TABLE TYPE STYLES

Activity	Software package	Functionality match (R A G)	Technical/ Integration suitability (R A G)
The scheduling of the delivery, installation or maintenance of equipment, goods or contract work.	TPG - VSM OCL – Workspace MBS - Outlook, MS CRM, MS TFS	Amber Green Amber	Amber Green Amber
The scheduling of human resources to undertake service oriented tasks, relating to the installation, maintenance or delivery of products and services	TPG – VSM OCL – Workspace MBS - Outlook and MS TFS	Amber Green Amber	Amber Green Amber
The processing of requests and enquiries from customers relating to the above mentioned goods and services (including cost estimates, problem logging and resolution, call out requests)	TPG – VSM OCL – Workspace MBS – MS CRM and Outlook	Amber Green Green	Amber Green Amber
The two way exchange of marketing, sales and operational information between the customer and company personnel (either on-site or at head office).	TPG – VSM OCL – Workspace MBS – MS CRM and Outlook	Amber Green Green	Amber Green Amber
Reporting of management and operational information on financial value of assets, call-out rates, problem resolution performance etc.	TPG - VSM OCL – Workspace MBS -MS CRM, MS TFS, Bespoke timesheets	Amber Green Amber	Amber Green Amber

integrate but is under review anyway as it is felt that this functionality can probably be gained through Microsoft CRM and TFS. The impression at MBS is that service management is not currently being supported as well as it could be by existing systems because of the absence of a holistic view and comprehensive analysis of the requirements of the service management process. This means that service management is reported on in components across varying departments. There is a lot of technically sound software in place, but it now needs to 'bed in', and this may require additional analysis and a degree of re-implementation and will certainly require further development of the current systems for which there is the expertise within the company.

V. CONCLUDING REMARKS

A major software provider [22] asserts that "despite the increasing importance of service in driving business success, many companies operate with disconnected service processes, disparate data, and isolated point solutions, which result in inefficient, manual service processes, high maintenance costs, ineffective planning, and, eventually, growing customer attrition and lost revenue". The case studies assessed in this paper suggest that 'service management' is neither clearly defined nor universally recognized in the context of SME business operations, either as a process or as a software system. This is no doubt partly because of the plethora of new management and software concepts that have appeared in the past decade – customer relationship management, knowledge management, content management, collaboration management, workflow, supply chain management, demand chain management; there are only so many concepts that a management team can grapple with, particularly in SMEs where business success often derives from a hard-nosed, 'seat of the pants' approach to management.

Nevertheless, the main activities that we suggest make up the service management process *are* generally recognized at an operational level in all three case study companies, and this suggests that service management will increasingly be seen as a core business process. This will be engendered by the continued development and increased deployment of service management systems. At present, however, the matching of service management activity to software system is fragmented and not well co-ordinated, with resultant problems in customer servicing. It has been suggested that the "strategic alignment of IT exists when a business organisation's goals, activities and processes are in harmony with the information systems that support them" [23]. However, only at OCL is this arguably the current position; at TPG DisableAids, where they *do* have a service management process and system, additional technology is used to try to improve software performance, notably in the provision of management information, and a major IS strategy overhaul is likely soon.

Market pressures are forcing companies to improve their efficiency and in particular the effectiveness to deliver customer satisfaction. Given the strong customer centric dimension to service management, it seems probable that – both as a process and business software package - the concept will grow in significance in the management and operation of SMEs.

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